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WHO GOES TO UNIVERSITY FROM TORONTO

John A. Buttrick

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Ontario Economic Council
Toronto, Ontario

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PREFACE

Six years ago, shortly after coming to Canada, I read an article entitled "The Income-Redistributive Effects of Aid to Higher Education" (Judy, 1970) in which the claim was made that, with respect to instruction, universities in Ontario were not changing much the income distribution. Essentially, the argument was that data did not refute an assertion that the net value of a university education to students was matched by the extra taxes paid by them. Of course, there are questions of whether the "value" of a university education is properly measured by extra earnings attributable to extra years of schooling minus private costs and also questions of what discount rate should be used to match future tax receipts with present public expenditures made on behalf of students. Quite aside from such issues, and on an impressionistic basis, it seemed to me that the data must be incorrect. How could it be, with only one-fifth of the university age group attending university, that such a high percentage came from relatively low-income families? In Minnesota whence I had come, the percentage going to university was over twice as large yet there a parallel claim could not be made. Further and again on an impressionistic basis, the students who faced me at York appeared to be more middle class than had been my Minnesota students.

This doubt led to this Study. On investigation, it did turn out that the data Professor Judy had used (but not collected) to estimate

parental incomes of university students were false. About the time I discovered this, Judy (1972) changed his assessment. If I had been sensible, that would have been the end of the matter. I was not sensible because, in the mean time, I had discovered a mine of data in the Ministry of Education on Grade 13 students. Five years earlier, in Colombia, I had been frustrated by a lack of decent data on education; therefore I leaped at an opportunity to use a large, good data collection to find out who does go to university and (maybe) why. Further, manipulation of a large collection of data would force me to learn something about computers and thus fill a void in my own education.

One thing leads to another. Would it not be possible to match the data I found in the Ministry of Education with data that would soon come from the 1971 Census? While I waited for Census results, the Ontario Universities Application Centre was started at Guelph and brought with it the possibility of more matching data. Then I discovered the old Atkinson (1957) and Carnegie (1959) reports.* Perhaps the raw data used to produce these reports were still available.

So the years passed. Census results were delayed and delayed again. Permissions to use the data I found were difficult and very time consuming to obtain. The raw data used in the Atkinson Study had been destroyed for reasons that are not clear; Guelph was sure that inadequate reporting by universities would make questionable the quality of their data tapes; I was prohibited from using data on teachers and had to promise to preserve the confidentiality of

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* Data tapes for the Carnegie Study are at the Ontario Institute for Studies in Education.

individual schools and universities -- although why institutions that are supported with public monies should be permitted to keep information about their operations secret still escapes me.

As the data came in, other problems arose. Quality was not what I had hoped and expected detail was not present. To mention some of these problems: (1) No cross-tabulations of Census data at the enumeration area level could be extracted from the data tape supplied by the Census. Further, the Census "rounded" data in an apparently incorrect and most arbitraty manner and there were omissions and errors. (2) An unexpectedly large fraction of the Carnegie student records had originally been mispunched, the code book supplied was incomplete, and many students (or their records) had been lost. (3) The Ministry of Education's Grade 13 CRØS tape was not nearly as complete as had been advertised, e.g., some 3000 North York honours diploma holders were simply missing and had to be added by hand. There were also punching errors. (4) The Guelph tapes were, as had been expected, a mess. Not only had universities failed to report many registrants but had reported so little information about other registrants as to make identification and matching with CRØS very difficult and, in some cases, impossible. (5) Limitations of both time and money (part of which were devoted to attempts to overcome the sorts of problems just listed) prevented search for additional data from schools, universities or CAAT's. In consequence, no attempt was made to gather data on performance of students past Grade 13 and only students from Metro Toronto for a very small number of years were considered.

Many people helped with the research but special thanks go to the following: Brian Wolfe who coded many home addresses into the appropriate census enumeration areas; Christine Deacon who coded public elementary school districts into census enumeration areas; George Lo who manipulated Census tape to sort enumeration areas into "neighbourhoods" and helped extract from the Carnegie data tapes the records of students from Metropolitan Toronto schools; Jim Wert who prevented many programming errors; Sally Holton and Will Anielewicz who matched data on one tape with those on another to create new data tapes and Professor Alan King who helped to unscramble the Carnegie tapes. In the Ministry of Education, the help of Robin Wigdor, Doug Penny and Dong Shin is appreciated; in Statistics Canada, Majella Quinn provided data. Finally, indispensable financial support has come from the Ontario Economic Council ($6,800) and from the Ministry of Education ($2,000). The Guelph Centre and the City of Toronto School Board supplied data without charge and thanks are due Dick Riley and Ed Wright. The Institute of Behavioural Research at York University provided copies of their Census tapes and punched cards at, I am sure, subsidized prices, and York University donated several thousand dollars of computer time. Noreen Maxwell typed a difficult-to-read manuscript with care and Louis Lefeber kindly read many parts of the manuscript. Two anonymous referees, Don Dawson and John Hause made helpful suggestions.

John A. Buttrick

A NOTE ON DATA

Almost none of the data reported or used in this Study are publically available. Much are stored on computer tapes; some are taken from confidential records kept by the Ministry of Education or by the Ontario Universities Application Centre at Guelph. This fact poses a major problem for a reader: there is no easy way to discover if errors have been made or if, for other reasons, false information has been used.

In an attempt to protect the reader, I have donated all the computer data tapes that were used in this Study to the Institute for Behavioural Research at York University. In this same place may also be found copies of the 1971 data tapes of Census enumeration areas. I have been assured that all these tapes will be made available to those concerned and interested, subject to the same confidentiality restrictions that I faced plus a modest fee. Access to materials located in the Ministry or at Guelph is, however, not mine to grant but I suppose that access would be provided to others on the same terms as it was provided to me.

Almost all of the computer programming employed SPSS which is described in the manual SPSS published by McGraw-Hill. Some of the data tapes themselves were constructed with MARK IV and PL 1.

In the chapters and appendices which follow, a great deal of actual data are reported. This is unusual in a study of this sort. Usually, however, the raw data may be found in publically available reports issued, e.g., by government bureaus. This is not the case with most of the data used here.

Relatively crude statistical manipulation has been performed and for this I apologize. I have, however, tried to guard against reporting

"non-facts" by, e.g., ignoring small differences between percentages and omitting cells containing small numbers of cases. While census data are reported (e.g., all Grade 9 students in 1959 or all Grade 13 diploma recipients in 1972) I do not have parallel data for other cohorts. This makes the "samples" I use ambiguous even though the number of cases are unusually large. Finally, I have concentrated in this Study only on students, schools and neighbourhoods in Metropolitan Toronto.

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CHAPTER ONE

INTRODUCTION AND PREVIEW

Currently about one-fifth of the 18-21 age group register in university in Ontario: more than this from urban areas and less from rural areas. Twenty-five years ago, only five per cent of the age group went to university. A university education was then and even more today is a necessary condition for various jobs carrying more than the average amount of power and responsibility and paying more than the average wage and associated benefits. In this Study, I examine the process by which some children are, in effect, selected for university while others are channelled or streamed away from university. This process is a crucial part of a larger question: What are the mechanisms by which income is distributed over society's members within one generation and across several generations?

Before one looks at any data -- and a great deal of this report consists of descriptive data -- the process of reaching university (or of not reaching it) may be described in general terms. Detail and evidence are found in subsequent chapters.

(1) Parents differ markedly in the early care and training they give to their children and many child psychologists believe that the type of care provided will determine much of what happens to a child after he/she reaches school. (White, 1973; Kagan, 1973). It is known that there are class as well as individual variations in patterns of child rearing and it is hoped that provision of advice and assistance to parents of very young children will substantially improve the chances of later success (as our society defines it) for children whose parents

are poorly prepared for the job of child rearing or whose economic resources are inadequate (Pines, 1975; Moore, Moon, Moore, 1972; Bowles and Gintis, 1973; Liebowitz, 1976).

(2) Elementary school is generally thought to be very important, not only because basic reading, writing and arithmetic skills are taught there but because performance in these early grades leads teachers and school principals to recommend each child for one or another of the secondary school programmes: commercial, technical, academic, vocational.[1] In the vast majority of cases, only children who enter five-year academic programmes will be able to reach Grade 13 and receive an Honours Graduation Diploma. And, under provincial rules, universities will be given BIU funding only for students who have this diploma (or equivalent) or who are at least 21 years of age and display academic competence. In brief, in most cases, the universities simply accept those students who have been selected for them by secondary schools out of the five-year academic stream. About 70 per cent of students in this stream do go to university. And, in Grade 8, the secondary schools, for the most part, put into the five-year academic stream only those students who have been selected for them by senior elementary schools. As will be seen in subsequent chapters, there is substantial evidence that many more students would register in universities if entry to the academic secondary school stream were less restricted. In brief, university admission is "rationed".

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1 Since the Ministry of Education's HS-1, "streaming" has been officially weakened. Now principals of senior public schools recommend a student for a particular group and level of courses in Grade 9 and students may mix academic and vocational or technical courses to some extent. It remains true, however, that students who have not completed work in academic subjects at Grade 12 level will not be able to enrol in Grade 13.

(3) Admission to the five-year stream and the retention rate within this stream during the secondary school years vary markedly across the schools of the Province. In Toronto, for example, schools located in more affluent neighbourhoods with high rates of home ownership display very high rates of admission and retention, and conversely. Parents desirous of university education for their children and able to pay for it presumably seek out such schools. In addition, there is a "neighbourhood effect" which leads even students whose parents are poor to enter the five-year stream if they live in a school district containing a high percentage of youngsters who are academically inclined (Coleman, 1968). In brief, it is virtually impossible to separate school from neighbourhood influences as related to the Grade 13 Honours Diploma rate. And both may, in any event, be largely the result of parental behaviour and decisions regarding child rearing and place of residence.[2]

So much for a brief description of the process by which some youngsters are selected for and reach university. How is this process to be evaluated? One attractive approach rests on two assumptions and a judgement: (1) that it is possible to construct a rank order of jobs across society ranging from those which require a great deal of formal education to those which can be quickly learned; (2) that it is possible also to construct a rank order of society's members in terms of ability to master and display high competence in the most demanding of these jobs on down to persons possessing only the most rudimentary skills;

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2 The recent studies issued by the International Association for the Evaluation of Educational Achievement reach parallel conclusions. See the volumes on Reading Comprehension and Literature Education in particular. In the case of Science Education and Mathematics, schools appear to be more important.

finally, (3) that it is "socially desirable" to match people with jobs from top to bottom. From this approach, two "social errors" may be defined: the error of putting a really competent person into an undemanding, routine and deadening job; the other of putting an incompetent person into a socially important and responsible position.

If scholastic aptitude tests administered in Grade 9 are used as reference, over 40 per cent of the highest-scoring youngsters never reach Grade 13 while about one-sixth of those who scored low on these tests do receive Grade 13 Honours Diplomas. Further, there is evidence that scholastic aptitude tests are biased in favour of children from middle and upper-class homes (Loehlin, et al, 1975; Goldberger, 1976; Husen, 1974). Thus the errors just defined are minimum estimates since most of the academically apt students who do not reach Grade 13 come from poor families, and conversely. It may be argued that a society displaying these "errors" will not fare well in historical competition with other societies.

But academic criteria may not be appropriate by themselves to detect or measure the magnitudes of the two errors being discussed. Schools and universities are one means of transmitting wealth from one generation to the next; transfer of ownership of property is another. Even if valued in crude monetary terms, the importance of human capital in the process of intergenerational transfer exceeds that of property for Canada and other nations with relatively high per capita incomes.[3] Perhaps one reason that government is so heavily involved in the control and management of schools and universities is to guarantee that

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3 Ownership of these two sorts of capital are, however, strongly correlated so the statement in the text may be weak.

intergenerational transfers are both orderly and equitable. "Orderly" presumably means that members of the public are able to make reasonably accurate predictions; "equitable" is harder to define since the concept evokes notions of historical precedent on the one hand and egalitarianism and "fairness" on the other. In selecting educational policies and controlling educational processes, government will search for compromises among the interests of competing groups within society. The expressed needs and political power of these groups change over time and this makes education a highly charged political matter.

Because poor people vote in smaller proportion than do those who are rich or middle class and because the political influence of more affluent and better educated groups exceeds their numbers, schools will not be able to adopt procedures that favour the children of the poor, i.e., the marginal voter will be middle class, counting from the top. This pivotal voter, we may suppose, will have had ancestors relatively poorer than is he and may, therefore, be sympathetic to educational training and selection that will benefit children whose parents are poor and ill-educated. Nonetheless, the primary interest and attention of this pivotal voter will focus on his own youngsters and their friends. He is unlikely to vote for processes that will push the intergenerational transfer of wealth away from them. The middle-class location of this marginal voter is important because of middle-class aspirations directed towards the rich. Further, information and argument directed at him will usually not represent the interests of nor originate among those below him in the social pecking order.

In sum, then, one should not expect schools to train and stream students in a manner that will much change society's distribution of wealth or income (Boudon, 1974; Thurow, 1972). Beyond this, middle class values (e.g., politeness, modesty, industry) should be expected to play a part in determining which children are specially encouraged by teachers. Further, one expects that emphasis will be placed on neighbourhood characteristics of schools. A good school will cause property values in its neighbourhood to rise and parents will view this as protection of their children from undesirable playmates and marriages. Without the broader perspective of provincial officials and some school functionaries, it would likely have been impossible to equalize expenditures within Metro Toronto across all students in a given grade; it does seem nearly impossible to spend more on the early education of children from disadvantaged homes, even though everyone is sure that they will remain in school for fewer years and thus receive a substantially smaller total expenditure of public monies. On balance, Grade 13 and university may currently be redistributing income from poor to rich in that benefits received by those who do not attend (these benefits are indirect) will be less than the corresponding taxes they will pay, and conversely.

Educational philosophers and administrators and many politicians have asserted over the years that free or heavily subsidized public education provides "equal opportunity" in the sense that proper training and encouragement in school will lead, in time, to a more nearly equal distribution of income and wealth. With reference at least to Grade 13 and university, these assertions may be false; even in California

where about fifty per cent of the relevant age group enter university, Weisbrod has collected data which purport to show (although ignoring research outputs) that university does redistribute income towards the rich (Weisbrod and Hansen, 1969; McGuire, 1976; Hartman, 1973). In An American Dilemma Myrdal (1962) pointed to a similar but more serious contradiction between statements in the U.S. Constitution and the actuality of Negro life in America.

Viewing schools and universities as devices to change the income distribution in a democracy, there are thus two major problems: (1) Policies which favour the richer fifty per cent of voters are apt to be approved over those which favour the poorer fifty per cent, i.e., the poor may have to settle for "trickle down" effects that are by-products of economic growth. (2) If government distributes schooling (or money or other commodities) equally over all residents, this will not produce equal outcomes for all -- unless these residents are themselves "equal" in other respects, as Arrow has recently demonstrated (Arrow, 1971). Children who are better endowed at birth or who have the advantage of affluent parents will be able to make better use of whatever the government provides; therefore, the combination of equal government but unequal private inputs will necessarily lead to unequal outcomes.

One solution of these problems proposed by some educators is to increase the number of years young people spend in school, especially in the case of those who display to teachers high scholastic aptitude. This "solution" will increase the number of teachers and the political power of educational bureaucracies but will not bring greater equality of income unless schools succeed in providing children from disadvantaged

homes with compensatory education. Current research suggests, however, that this is difficult and may require very much larger expenditures on behalf of children from poor homes; it may require direct subsidization of the families of such children.

Educational administrators who recognize and accept this line of argument work within a bureaucracy and face political constraints: (1) Imagine how affluent parents would respond to knowledge that their children will receive a worse education, especially in early grades, than will children whose parents are poor and who therefore have smaller tax bills. (2) With an overall educational budget that is growing slowly, imagine how university and secondary school teachers would respond if told that extra monies for elementary school must come from university and secondary school budgets. Extra money spent now on the elementary education of disadvantaged children will lead to increased enrolments in secondary school academic programmes and in university and more spending then at these levels of education, but the time lag will be 10 to 15 years. This is beyond the time horizon of the typical politician.

In sum, it would appear that politically controlled schools and universities cannot easily be employed to redistribute income between generations in the direction of greater equality. And if they were operated under a market system and charged tuition fees they also would not redistribute incomes. Before accepting this conclusion, however, one should look at other possible consequences of the educational process: (1) As an increasing percentage of the relevant age group undertakes post-secondary education in a CAAT or university, the supply of professional, semi-professional and managerial labour may expand

more rapidly than demand. The resulting changes in wage rates could result in relative increases in the wages of blue collar workers.[4] This, in turn, could cause changes in school curricula and funding that would benefit disadvantaged children, e.g., a greater emphasis on teaching reading and arithmetic skills to all children in elementary grades and much higher tuition rates in university. (2) As the private net benefit of university education falls, the marginal voter (who is likely to be middle class) may find that the expected benefits of higher education for his/her children are frustrated by reality. Already there is a marked difference between what youngsters say they wish to do in life and what they actually find themselves doing, e.g., more than twice as many Grade 12 pupils want to become teachers as do in fact become teachers. As this happens, a desire for higher income and status could lead marginal voters to turn away from schools as a way of achieving success for their children. This in turn, could lead to more money for elementary but less money for academic secondary school programmes and post-secondary education. (3) Under such circumstances, nationalism could develop as a way of weakening class divisions and benefitting particularly the lower middle class. (4) If changes of the sort just described do occur, we may suppose that educational administrators and politicians will respond with suitable curricular changes. Universities should respond similarly but they have the capability of undertaking research as well as teaching. If their teaching function becomes less important, one may suppose

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4 Jan Tinbergen (1975) argues that this effect has and will result in greater equality of incomes. See also Chiswick (1976).

that university administrators will promise extra benefits for society from increased public support for research. Research could increase the growth rate of the economy and might make more equal the income distribution, or so it will be alleged. Why research should be concentrated in universities is, however, another question.

The remarks in the paragraph just above are speculative and refer, in any case, to longer run possibilities. In the shorter run, I am left with a strong conviction that schools will usually reflect neighbourhood characteristics, that most parents select neighbourhoods and schools on the basis of what they can afford and what the sub-culture to which they belong dictates, and that political mechanisms will be used to reinforce or at most be neutral towards this parental-neighbourhood-school conformity.

Outline

As indicated in the Table of Contents, the substantive part of this Study comes in nine chapters and four appendices. In Chapter Two, a production function for ability is presented and, on theoretical grounds, the argument is made that the probability of attending university is largely determined by parents in the upbringing they provide for children and by choice of residential neighbourhood and school. In Chapter Three are found data on reading ability in elementary grades by parental occupation and selection of secondary school program. Parental and student desires and occupational goals do not appear to be important in this respect. In Chapter Four, using older data, the influence of parental occupation, sex, and scholastic aptitude in Grade 9 on the probability of obtaining a Grade 13 Diploma are

discussed and, in Chapter Five, average marks and scholastic aptitude in Grade 12 are additionally related to the probability of receiving a Grade 13 Diploma. In Chapter Six, an attempt is made to compare schools and student performance in the early 1960s and ten years later. Chapter Seven uses Census data to sort Metropolitan Toronto into neighbourhoods and then attempts to separate neighbourhood from school as influences on the probability of obtaining a Grade 13 Diploma. Chapter Eight provides an estimate of the percentage of Grade 13 students who enrol in university and describes the manner in which students select (and are selected by) a particular university. Chapter Nine estimates the public and private costs of education past school-leaving age and relates these to (cross-section) data on subsequent earnings and tax payments. These admittedly crude estimates are then applied to Grade 8 youngsters grouped by neighbourhood schools. In Chapters Ten and Eleven some options for educational policy are explored and possible criteria for evaluation are considered. In the Appendices are found tables giving data supplementary to those found in the text, disaggregated data on elementary public school districts, schools and universities, and detail on the definition of neighbourhood and the estimation of the percentage of Grade 13 students who go on to university.

CHAPTER TWO

THEORETICAL FRAMEWORK

General Formulation

The process by which a child grows, is nurtured, trained, tested and finally reaches university may usefully be divided. First comes the infant equipped with a particular genetic endowment which is modified by the care and training provided by parents. Second is the period of school attendance through Grade 6 during which rudimentary training and testing takes place. Third comes senior public school and further testing at the end of which a child finds him/herself in one or another secondary school programme: four-year academic, five-year academic, commerical, technical, vocational. As will be seen, with few exceptions (and neglecting immigrants) only youngsters from the five-year programme go to university.

The first stage above may be represented as follows:[5]

(1) $A = Bf(P)$ with $P = Tg(C,I,E)$

where A is the child's displayed ability on entering school, B is his/her genetic endowment and P is the care and pre-school training provided by parents which may be viewed as arising from the parents' cultural heritage (C), income (I), their own level of formal education (E) and, given these, their own ability to raise children who will perform well in school (T).[6] Notice the assumption that B and T enter these functions multiplicatively, i.e., they are treated as neutral scale factors. This arbitrary assumption will play an important role and is discussed subsequently.

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5 After writing the equations which follow, I discovered A. Leibowitz (1974) in which a closely parallel approach is used and a great deal of useful material is presented. See also S. Bowles (1970) and Henderson et al (1976).

6 Parental occupation could also be entered as an argument in (1). Both for simplicity and because income may be viewed as being produced by occupation (and education), this was not done. Income can easily be viewed as a measurable variable; occupation cannot.

In second and later educational periods, parents are joined by schools as influences on the child, i.e.,

(2) $A_s = Ah(P,S)$,

with S representing school inputs. Notice that A = Bf(P) enters (2) multiplicatively. Although data suggest that schools are quite important in these later periods, parents select the neighbourhood in which a child lives and thus the school attended (or, have the choice made for them by their income, wealth and cultural heritage) i.e. S = H(N) and N =G(P). And the probability of being assigned to the five-year academic programme by the school system depends on characteristics of the neighbourhood in which a child's school is located as well as upon parental wishes and resources and a child's own scholastic ability.

If this is a correct formulation, then substitution of one relation into another gives, with U being the probability of reaching university:

(3) $U = A_s F(S,P,N)$ which amounts to saying $U = B\,\phi(P)$

i.e., both schools and neighbourhoods vanish under substitution. But parental influence in turn, we suppose, is determined by cultural heritage, income and education of parents and by their ability to raise children (Lacombe, 1973):

(4) $U = B\,\phi\,[Tg(C,I,E)]$

To check the reasoning used above, take an extreme alternative process, namely suppose that parents do not choose the neighbourhood in which they live nor the school their children attend; instead make the extreme assumption that parental choice of neighbourhood is the result of a random process in which each family is equally likely to locate anywhere in the city. At the outset there could be different sorts of neighbourhoods, or all

might be identical and school characteristics might match neighbourhoods or be distributed independently from neighbourhoods. But if random location were the case, again schools and neighbourhoods would wash out in aggregate data and, after reduction, parental influences would again be all that would remain; only the functional relationship would be different.

From this analysis, it does not follow that schools will be forced to play an entirely passive role by the geographical movement and influence of families. An individual teacher can spend more or less time with slower pupils and less or more time with those who learn rapidly or who have received a head start at home. It could be that teachers who incline in one direction or another are concentrated by school. Principals as well as teachers may differ in competence and educational philosophy. While better teachers and principals probably move to easier teaching situations (which are likely to be found in more affluent neighbourhoods) countervailing professional and personal pressures do exist. In brief, while one expects average characteristics of schools and neighbourhoods to conform one with the other, one expects different dispersion patterns around average school and neighbourhood characteristics. In addition, neighbourhoods change to induce corresponding change in the associated schools, and this cause - effect relationship may sometimes work in the other direction.

Some teachers and educational administrators will object to a model which heavily emphasises what parents are able to accomplish for their children, especially since parental choices are necessarily constrained by family income and wealth. Many educators would prefer a formulation that permits them to neutralize or overcome parental influences and choices and instead, assigns to schools the task of sorting and training young people

so that the smartest and most public-spirited members of each generation reach university and are well prepared for what they will be required to do there and in later life.

In this paper it will be my aim to test these possible formulations of the process by which some young people reach Grade 13 and then continue into university while others do not. For this purpose, I have found and will use several data collections which are described briefly below. The model summarized above must be designed and interpreted to fit these available data:

(1) From the 1971 Census, we have all the information currently available on the enumeration area tapes for Metropolitan Toronto, which includes data on educational attainment, religion and ethnic identification, income, occupation and language (but no cross tabulations). There are 4012 of these Toronto enumeration areas and in each reside about 500 persons of all ages or about 200 families. Data on individuals are not available.

(2) From the Carnegie Study, we have a secondary school academic history (including marks, teacher evaluations and various tests scores) for every student who was enrolled in Grade 9 in 1959 in an Ontario school, together with the name of secondary schools attended and parental occupation and language.

(3) From the Ministry of Education and the Ontario Universities' Application Centre, there is a list of all students who received Grade 13 diplomas in 1972 and a list of all who registered for the first time in an Ontario university in 1972. It has been possible to locate most of the students recorded on these lists and who resided in Metropolitan Toronto in the appropriate Census enmeration areas, and the secondary school attended by each is known. For most of these students, sex, age, average Grade 13 marks and three scholastic aptitude (SACU) scores are known.

(4) From the "Every Student Survey" conducted in 1970 in the City of Toronto public schools and from a follow-up survey, we know the occupational and language distribution of parents for pupils in each grade, reading scores for pupils in Grades 4, 6, 8 and 9 and the Grade 9 destination of all Grade 8 public school students for one pair of years by school.

(5) We also have available some data from the Atkinson Study and recently published investigations of post-secondary intentions of Ontario students by Anisef (1976), by Porter, Porter, and Blishen (1973) and by Breton (1972). For the first two, follow-up studies are also available.

Problems

These data are incomplete and, in some cases, are obviously defective; better data, however, appear to be unavailable, e.g., information on characteristics of teachers by school or information regarding work experience or hobbies of students. In terms of the formulation found in statements (1) through (3) and summarized in (4), there seems to be no way of isolating the effect on scholastic aptitude or the probability that a student will reach university of B (genetic endowment) or of T (parents' ability to raise children). In part, however, this problem may be circumvented by the functional form used in writing (1). To illustrate, suppose that A (student ability) is accurately measured by scores on some test. At the end of the first year of life, we assume that $A_1 = Bf_1(P_1)$; at the end of the second year, $A_2 = A_1 f_2(P_2) = Bf_1(P_1)f_2(P_2)$; or in general, during the pre-school years,

$$(5) \quad A_t = A_{t-1} f_t(P_t)$$

An estimate for B (which is presumably unobservable) would be found by taking the test score and "discounting" by parental treatment of the child, i.e., $B = A_1/f_1(P_1)$. But how to observe or measure $f_1(P_1)$ is moot.

It is clear, however, that the ratio of test scores in a pair of adjacent years does not depend upon B; indeed, it depends only upon what takes place during the period since the last test was administered (and, of course, on the test instruments used to measure ability). This may seem intuitively implausible although it is the logical consequences of writing $A = Bf(P)$ rather than the more general $A = F(B,P)$.

To justify or rationalize this special functional form, suppose that we interpret "genetic endowment" as a description of a biological mechanism that is able to receive various "inputs", e.g., food, parental care, stimuli from the physical environment, and then transform these into "outputs" which are measured (and defined) by test scores. In this interpretation, a better genetic endowment simply means a mechanism that will make better use of whatever inputs are given to it, without bias in favour of or against any particular type of input. In brief, B plays the same role in this function as is played by "Hicks neutral" technological change in a production function. The reader will have to decide whether or not this is a plausible interpretation of genetic endowment. It does, however, fit rather neatly some data on reading ability in City of Toronto Schools, as will be seen in Chapter Three.

The child-rearing ability of parents has been treated in the same way as genetic endowment, i.e., some parents are able to make better use of their own cultural heritage, income, and education than are others. Hence a group of parents who are identical with respect to culture, income and education will not produce identical children, even if the children could be genetically identical. It follows then, that total differentiation of (5) above, after substituting for dP from (1), yields:

$$(6) \quad d(A_t/A_{t-1}) = Tf'_t (g_C\, dC + g_I\, dI + g_E\, dE)$$

which incorporates an assumption that T does not change over time nor does the g-function. dC, dI and dE are to be interpreted as the effects on the ratio of ability test scores received by groups of students as cultural heritage, family income or formal education changes as one group of parents is replaced by another, or as these characteristics of the same group of parents change over time. In the latter interpretation, one would be inclined to treat C and E as constants except possibly in the case of immigrants. f'_t and g_I have obvious meanings but their combined value is measurable (when C and E are held constant) only if A_t/A_{t-1} is treated as a measurable variable. Subject to this, E can probably also be defined in a manner that will give meaning to g_E even though, in general, one year of formal education is not the same as another. I do not see, however, how C is to be defined so that g_C is made meaningful. In what follows, therefore, C is treated as a constant, in much the same way as sex is treated.

The reader will have become increasingly alarmed to see variables such as T,C and E being used since it is not clear that any of these is quantifiable. On an individual basis, they are not; on a group basis, they may be, e.g., the percentage of parents in some neighbourhood who identify themselves as "Italian" or the percentage who state that their religious preference is "United Church" is a measurable variable. In the case of education, in similar fashion, one can treat the percentage of male or female parents in a neighbourhood who have at least a high school diploma or who have a university degree as a measurable variable. T is more troublesome since it is unobservable. For a group of parents, all one can do is treat its average value and variance as (arbitrary) constants.

Crucial is the assumption that A_t/A_{t-1} is legitimately defined as measurable. But this assumption will be correct only if ability is defined by the score received on one particular test or if scores on each of a set of tests are linearly related to scores on other tests in the set. Schools, however, increasingly do use tests in just this way and, provisionally, so will I.

Some Details of the Model

Once a child reaches school age, the influence of parents is augmented by schoolroom, playground and neighbourhood experiences, and outside influences (such as TV) become part of a child's environment. As the years pass, an increasingly larger fraction of a child's waking life will be spent away from direct parental influence. Scores on a set of ability tests administered at the beginning of second and subsequent grades could, therefore, be viewed as "produced by" schools and the larger society as well as by parents and neighbourhood, e.g., when a child is seven,

$$A_7 = A_6 f_7(S_7, O_7, P_7, N_7)$$

Following the earlier pattern, this function may be simplified by assuming that parents select the neighbourhood in which they live (or have it selected for them by their income, wealth and cultural heritage), i.e., $N = G(P)$, and that parents regulate and filter the flow of outside influences, i.e., $O = \psi(P)$. Again, use of a ratio of test scores in adjacent years permits further simplification, given the functional form being used, i.e., for this schooling period and after substitution:

$$(7) \quad A_t/A_{t-1} = h(P,S)$$

As will be seen in Chapter 3, there is some evidence that this h-function is separable in the sense that h_{sp} is approximately zero.

It should be admitted that relation (4) above represents an extremely deterministic picture of the process by which some youngsters reach university while others do not. Through construction, the influence of parents, both directly and through their choice of neighbourhood and school, is (except for residual roles assigned to genetic endowment and parental child-rearing ability) about all that matters. At some point in their school careers, students do, of course, exercise an influence of their own. This influence derives, we may suppose, from the student's own survey of likely future prospects which are associated probabilistically with various actions he/she might take in the present. What sorts of prospects are viewed as "possible" and what actions are considered to be "permissible" will not, however, be idiosyncratic. Parental, school and neighbourhood influences will largely determine what these constraints will be. Such an interpretation permits maintenance of a deterministic view but suggests that a relation like (4) should be augmented by inclusion of random variables. Since we are interested in describing "average" cases, however, we will not do this formally: Should a differeent random variable be included for each group of students? How should students be grouped for this purpose? Should the random variable be systematically changed if good or bad times are expected?

To continue the discussion of problems, turn next to the relation between neighbourhoods and parents, i.e., $N = G(P)$. A necessary condition for a group of dwelling units and people to be a "neighbourhood" is geographical proximity but that is not a sufficient condition. In addition and by definition, there should be bonds of mutual trust and joint responsibility over the group of persons. Distance presumably weakens these bonds; shared experiences may strengthen them. Thus, if one dropped the geographical condition, a "neighbourhood" could consist of persons who came to know one another at work or through clubs, religious institutions, ratepayer or

professional associations, etc. Data on such matters are, unfortunately, unavailable.

As a substitute it is possible to divide Metropolitan Toronto into areas occupied by persons who have similar characteristics as reported in the Census, e.g. ethnic background, religious preference, occupation, education,income, type of dwelling unit, permanence of residence. For this purpose, however, the smallest area permitted by the data is a Census enumeration area. These enumeration areas are small enough so that ten are found in an average elementary public school district and, in the vast majority of cases, school district and enumeration area boundaries are such that enumeration areas are not split between school districts (both boundaries usually run down the middle of city streets although this is an odd place to put them, given the stated Census objective of creating relatively homogeneous enumeration areas).

In brief, then, it is possible with census data to group enumeration areas together into "neighbourhoods" according to the reported characteristics of residents and according to public elementary school district boundaries. It is hoped that this procedure will create "neighbourhoods" among which parents might choose in reaching a decision as to where they will reside.

To see if this is reasonable, consider how parents, newly arrived in Toronto, might decide where to live. These parents, we will suppose, gather information in a variety of ways about various residential areas which are feasible in terms of cost (given their family income and wealth) and desirable in terms of observable characteristics of dwelling units, existing residents, schools, distance to work, etc. To be feasible, an area obviously must contain dwelling units which are currently for sale or rent.

Parents who are already residents of Toronto will presumably also test the housing market from time to time and move as their circumstances and desires change or as dwelling units come up for sale or rent in what they view as more desirable areas.

The results of this process may be summarized by supposing that the richest families will first select what they believe are the best residential areas and dwelling units, the next wealthiest families will have second choice among what is then available, and so on down to the poorest families who will be forced to select from dwelling units and areas that are left over. If N and P are both measured in terms of income or wealth, it is thus plausible to suppose that $N = G(P)$ has an inverse. Of course, this selection process is on-going slow and imperfect. Hence, Census data will give only a snapshot of an intermediate stage; The snapshot obtained from another Census could be different.

Alternatively, it is possible to view the process as one in which vacant dwelling units find parents rather than the other way around. The housing market has a supply side as well as a demand side. If there is ethnic or religious discrimination on the supply side, even a wealthy family may be unable to obtain a dwelling unit in the residential neighbourhood it most desires. Looking at the choice of neighbourhood from the supply side, we may suppose that family income and cultural heritage and perhaps occupation are most important. Looking at the choice from the demand side, it is these same variables, augmented by education and job location, which seem most important. Whether this is so, however, is an empirical question and relevant data are considered in the appendix to Chapter 7.

Turn finally to the relation between schools and neighbourhoods, denoted by $S = H(N)$. From the remarks just made about the relation between parents and neighbourhoods, schools are here viewed as only one characteristic of neighbourhoods, although a particularly important one, e.g., descriptions

of vacancies in the real estate sections of newspapers often include mention of school districts, e.g. Deer Park or John Ross Robertson. First claim on places in a public school goes to parents living within the school district; those living farther afield may enrol their children only if the school is not already full. This is not the case with private schools. Insofar as there are differences among public or separate schools, it thus seems clear that neighbourhoods "choose" schools rather than the other way around. A very good school may, however, attract parents to a neighbourhood whose other characteristics would repel them, and conversely. Again, then, using a longer time frame, we suppose that $S = H(N)$ is some sort of "compromise" function and does possess an inverse, except in the case of private schools. Again the evidence is empirical and is discussed subsequently. It should be recognized, however, that with aggregative data for one or a few years, "exceptions" to neighbourhood-school conformity will be difficult to detect.

At a theoretical level, a major problem arises from the discussion of the last few paragraphs: There may be no way of separately identifying the influence of parents, of neighbourhood, or of school on, say, the probability that a student willl reach Grade 13 and continue into university. Indeed, the only possibility of so doing will be if some of the relationships postulated are weak, i.e., have relatively low correlation coefficients. Then there will be parents with different characteristics in the same neighbourhood and youngsters from different neighbourhoods in the same school. There are reasons to guess that this will be the case.

As mentioned earlier, it may be that all the schools are nearly the same, in the sense of buildings, equipment and teachers. We do know, for

example, that the annual amount of money spent on the average child in every elementary and senior public school grade is almost the same over all of Metropolitan Toronto and a parallel statement may be made for secondary school pupils up to school-leaving age. This does not mean, however, that all the schools are the same in terms of student characteristics nor, therefore, in the relations among teachers and students. Nonetheless, Toronto's budgetary practice should result in a weaker relation between schools and neighbourhoods than obtains, for example, in a US metropolitan area where much larger amounts of money are customarily spent on the education of suburban children than of inner-city children.

With reference to the relationship between parents and neighbourhoods, the Ontario Human Rights Code, Ontario Housing, widespread acceptance if not approval of "multi-culturalism" and the weakness of the link between real estate or other tax receipts and expenditures for municipal services should all reduce the differences in desirability of one residential area over another, i.e., rich and therefore also poor are likely to be scattered in pockets over wide areas of Metropolitan Toronto.

For these reasons, we expect that G(P) and H(N) will not be as strong relations as they would be, for example, in the United States. In consequence, it may be possible to separate to some extent the influences on Grade 13 attendance or university registration of schools, parents, and neighbourhood.

Much of what has been presented in this chapter, because of defective data and limitations of time and energy has guided the research in spirit more than in detail. For this I apologize but hope that other investigators will find the frame of reference and the data tapes useful.

CHAPTER THREE

ENTERING SECONDARY SCHOOL

Statements such as "it is obvious why children from poor families drop out of school; they cannot afford to stay longer" or "parents who are not well educated and who have no books in the home can scarcely be expected to raise children who do well in school" or "everyone knows that Jews (or Chinese) specially urge their children to high academic achievement" are not informative. They do not establish cause and effect relationships nor lay bare the process by which an effect is produced. It remains to be seen if I can do better.[7]

Start with the schools. At the end of Grade 8, a decision is made to place each child in one or another secondary school program. Before HS-1 these were called: five-year academic, four-year academic, commercial, technical, vocational. This crucial decision is made by the principal of the Grade 8 school but is made with attention to what the parents want or will readily accept and with attention to the school's own past history, i.e., the percentage of youngsters put, for example, into the five-year academic program from a given school does not appear to change much from year to year. I believe that parents select a neighbourhood (and school) with knowledge of what the school's history is but have only casual evidence for this belief. What is known -- albeit only for one year -- is that the percentage of youngsters put in

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7 See P. Anisef (1976), for a sociological focus on these questions.

each program varies greatly from one school to the next and that schools and neighbourhoods are linked. Table 3.1 presents evidence from the City of Toronto schools for 1970-71. See Table 3.2 for a coded list of schools and an implicit definition of the groups into one of which each school has been put. Group 1 schools are in rich neighbourhoods and Group 4 schools are in poor neighbourhoods (see also Appendix Tables 3.1 and 3.2). Parallel data for other parts of Metro or for other years do not seem to be available (Clark, et al, 1969).

Reading Ability

Going back into elementary school, it is easy to guess what happened there to produce this Grade 8-Grade 9 result: Some parents (and neighbourhoods) were unable to prepare their children for success in Grade 8 while other parents did an excellent job. Critical to these efforts is reading ability. Unfortunately, however, scores on reading ability tests are available to me only by parental occupation and then only for all Toronto public schools taken together. Scores by individual school do exist but are viewed as confidential, even though public monies pay for public and separate schools. Nonetheless, the aggregate data presented in Table 3.3 suggest that, in the cooperative effort of teaching children to read, what the schools accomplish (as measured by the test instrument used) is not affected by parental occupation, i.e., the ratio of the score received by pupils in Grade 6 to the score received by pupils in Grade 4 is approximately the same over all parental occupational groups, and the same is true for the other test score ratios. Children from higher parental occupational groups have a head start in Grade 4, and (because these ratios are constant over all parental occupations) this initial advantage is amplified by what the schools do.

An explanation of why these ratios are constant over parental occupations may be erected upon one "fact"and one assumption. The fact is that in allocating monies over the various schools within its

Table 3.1 Per cent of students from each group of Senior Public Schools who subsequently reach Grade 13 and continue into University - City of Toronto, 1970-71

Senior Public School (Grade 8) Origin	Grade 9 Programme			Reach Grade 12	Reach Grade 13	Enter CAAT	Enter University
	Non-diploma*	4-year	5-year				
Group 1 (4 schools; 709 pupils)	1	10	89	96	76	12	54
Group 2 (4 schools; 561 pupils)	7	14	79	79	54	14	47
Group 3 (11 schools; 2222 pupils)	23	27	50	55	31	9	20
Group 4 (10 schools; 1925 pupils)	28	30	42	44	19	17	12
All	20	24	55	59	35	13	24

Source: Research Service, Board of Education, City of Toronto and data described in Buttrick (1972).

* Includes programmes in vocational schools to which about 26% of these students go. Oddly enough three schools in Group 4 send very few students to vocational schools.

N.B. All Private and Separate School pupils are omitted.

Table 3.2 City of Toronto Public Schools in Rank Order, 1970

Senior Public Schools

Code Name*	% High Blishen Score**	% Low Blishen Score
	Group 1	
216	64	4
298	52	10
238	44	16
523	n.a.	
	Group 2	
233	29	20
239	23	20
311	31	23
293	15	34
	Group 3	
272	9	42
249	5	43
222	4	49
305//	3	47
262//	7	52
202	5	49
226	4	49
304	3	49
219//	2	48
286//	9	57
269	3	55
284	5	53
302	5	54
	Group 4	
243//	3	58
248//	5	65
266	2	55
225	3	58
261//	1	50
252	2	62
229//	2	68
273	1	64
201//	1	60
247	2	71
277	1	71

Secondary Schools

Code Name	% High Blishen Score	% Low Blishen Score
	Group 5	
540	57	5
525	59	7
508	51	5
	Group 6	
520	35	20
530	25	18
620	27	21
515	20	29
	Group 7	
555	10	38
535	8	36
545//	14	44
550	8	43
615//	5	43
505	6	49
510	8	50
	Group 8	
618	3	50
715//	3	56
605	5	52
625	4	52
705	3	55
610	3	59
710	2	63
803	3	63
805	1	61
603	2	65
725	1	67
810	n.a.	
850	n.a.	

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* I am required to use code numbers rather than school names to preserve confidentiality.

** Father's occupations were coded by means of B. R. Blishen's scale (1967).

// Contributed most to low correlation coefficient.
Schools for which occupational breakdowns were unavailable were classified on an ad hoc basis.

Table 3.3 Reading Vocabulary and Comprehension Scores by Occupational Groups of Parents, Toronto, 1971

	Grade 4		Ratios → Grade 6 / Grade 4		Grade 8 / Grade 6		Grade 9 / Grade 8		Grade 8	
Parental Occupation	Ave.	Coef. of var.	Ave.	Coef. of var.	Ave.	Coef. of var.	Ave.	Coef. of var.	Ave.	Coef. of var.
14 (low)	3.32	.41	1.58	.94	1.28	.95	1.30	.83	6.86	2.41
2	3.35	.38	1.56	.92	1.35	.95	1.24	.89	7.04	2.37
3	3.56	.37	1.55	.94	1.32	.92	1.24	.92	7.28	2.32
4	3.78	.35	1.65	.96	1.19	.96	1.30	.77	7.44	2.40
5	3.86	.36	1.62	.93	1.27	1.00	1.22	.76	7.96	2.69
6	4.00	.34	1.58	1.04	1.28	.83	1.25	.83	8.04	2.38
7	4.31	.35	1.54	.91	1.28	.93	1.20	.79	8.48	2.55
8	4.58	.30	1.59	1.11	1.27	.84	1.21	.63	9.21	2.56
9 (high)	5.13	.28	1.52	1.05	1.25	.89	1.18	.64	9.74	2.58
unweighted averages	3.99	.35	1.58	.98	1.28	.92	1.24	.78		

Source: Wright and Reich (1972)

Notes:

1. The coefficient of variation is the standard deviation measured in units of the mean. If the ratio of coefficients of variation = 1, then the original distribution is unchanged.

2. To find overall changes, multiply ratios across each row and then apply these to the Grade 4 averages.

3. By combining scores on vocabulary and comprehension, I am assuming that each test gives an independent estimate of a child's reading ability.

4. The various parental occupations were coded by Professor Blishen's socio-economic scale, e.g., code 14 is mostly unemployed; 2 is labourers, etc., 3 is mechanics, etc..., 9 is lawyers and managers, etc.

5. The Grade 9-Grade 8 ratio is not comparable to the other ratios since students in (Grade 9) vocational schools were excluded from the survey. From a few schools in poor neighbourhoods as many as a third of the Grade 8 class will go into vocational schools while elementary schools in rich neighbourhoods will send only a handful of students a year to vocational schools. This omission should bias upwards the average scores at the top of the 9/8 column and bias downward the associated standard deviations.

6. Pupils in special education classes were omitted throughout; 5 per cent of all pupils attended these ungraded, remedial classes, most of whom come from low-Blishen homes.

jurisdiction, the Toronto School Board devotes almost exactly the same resources annually (on the average) to all children regardless of school or parental occupation.[8]

For the assumption, return to the last chapter and the production function for reading ability there presented, namely $A_t = A_{t-1}\, f(P_t, S_t)$. An implication of this form of the production function is that the ratio of test scores of reading ability depends only upon what schools and parents accomplish during the period between tests. Since the schools do devote nearly the same resources to each child, $dS_t/dP_t \simeq 0$. Hence,

$$(1)\quad \frac{d(A_t/A_{t-1})}{dP_t} = f_p + f_s \frac{dS_t}{dP_t} \simeq f_p$$

But the data found in Table 3.3 indicate that $f_p \simeq 0$.[9] This, in turn, implies that $f_{ps} = 0$ and, therefore, that $f(P_t, S_t)$ is a separable function.

This result does depend critically on the test used and the procedure employed for scoring it. Reading ability is not a "real variable," i.e., it cannot be counted like cans of peas or tons of steel, and thus a "reading grade level" (RGL) of "2" cannot be treated as twice as much reading ability as an RGL of "1" nor will the difference in RGL of "6" minus "5" necessarily be the same as the difference of "3" minus "2". For this reason, a critic could add a constant to each score in the data underlying Table 3.3 and thereby destroy the result just reported in the text. (Multiplying by a constant would, of course, leave the result intact.) Nonetheless, the test employed, Gates-MacGinitie, is a commonly used instrument and the results displayed in Table 3.3 have not been found in other jurisdictions that use this same set of tests.

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8 Actually the Board does put 3-5% more money into "inner-city" schools but the quality of instruction in such schools is probably a bit lower than in schools located in other neighbourhoods.

9 The summary data reported in Table 3.3 are all that are available to me. One wonders whether data by classroom or school would yield parallel results (Henderson, et al, 1976).

Differences in parental occupation may have so little effect over this childhood period because children then spend so much time in school and at homework, playing with friends, engaged in organized sports, watching TV and eating and sleeping that parents have very little chance to help or hinder. In the first few years of life, matters must, however, be otherwise.

In a loose way, these data on reading ability may be coupled with the data summarized in Table 3.1 above and this is done in Table 3.4. In this table, making use of standard deviations and an assumption that reading scores are normally distributed,[10] I estimate the number of youngsters in Grade 8 by each parental occupation who are able to read "well enough" to be put into the five-year academic stream. "Well enough" is defined so that the total number of students thus classified matches exactly the total who actually were put into the five-year academic stream. The "cutoff reading ability score" thus defined is an RGL of 7.2, which will probably strike the reader as rather low. Nonetheless, children from Group 1 schools with lower reading ability scores than this do enter the five-year academic programme, while children with higher reading ability scores than this - if they come from a Group 4 school - do not.

To see how the table is constructed, take the 8.3 per cent of children whose fathers are managerial or professional (code 9). Assume that the reading ability of these youngsters is normally distributed with 6.9 per cent reading at 7.2 RGL or above and 0.4 at 5.43 RGL or below (taken from Table 3.3, the last column). Apply these cut-off values to the code 9 students in whichever group of schools they are found. Do the same for all other groups of students and sum to obtain, e.g., 74 per cent (9.7) of students in "Group 1" schools reading at or above 7.2 RGL and 11 per cent (1.4) reading at or below 5.43 RGL.

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10 This assumption is not critical; what is critical is that reading ability scores for each parental group have the same distribution.

Table 3.4 "Expected" and Actual Distribution of Students in City of Toronto Schools by school group and programme 1970-71
(Percentages)

Parental Occupation Code	Groups of Schools 1	2	3	4	Total	% Reading at 7.20RGL or above	% Reading at 5.43 RGL or below
1+11+13+14	0.7	0.7	5.4	5.7	12.5	5.5	3.4
2	0.8	2.5	18.0	19.8	41.2	19.3	10.3
3	0.2	0.6	3.8	2.6	7.2	3.7	1.5
4	0.5	0.6	2.5	1.5	5.1	2.8	1.0
5	0.8	1.5	4.8	2.1	9.2	5.6	1.6
6	1.3	1.0	2.4	1.3	6.1	3.9	0.9
7	1.3	0.7	1.5	0.8	4.4	3.0	0.5
8	2.1	1.0	1.1	0.4	4.7	3.7	0.3
9	5.4	1.6	1.0	0.3	8.3	6.9	0.4
10+12	0.1	0.3	0.3	0.6	1.3	0.9	0.2
Total	13.1	10.4	41.0	35.5	100.0		
In 5-year programmes:							
Actual	11.7	8.2	20.5	14.9		55.3	
"Expected"	9.7	6.4	21.6	17.6		55.3	
In non-diploma programmes:							
Actual	0.1	0.7	9.4	9.9			20.1
"Expected"	1.4	1.7	8.8	8.2			20.1

A comparison of "expected" and "actual" numbers in these bottom rows indicates that schools (or neighbourhoods) do indeed influence the choice of stream, i.e., that the probability of being put into the five-year academic stream would be increased if a high-reading-ability student were moved from a school in a poor neighbourhood to one in a richer neighbourhood. Similarly, the probability of being put into a non-diploma programme would be increased by attending a school in a poor neighbourhood. By necessary implication, some youngsters from Group 1 schools whose reading ability level is less than 5.43 RGL are put into diploma programmes, while youngsters from Group 4 schools with higher reading ability scores than this find their way into non-diploma programmes.

There is no way of telling from the data just reported whether the phenomenon just identified is attributable to school or to neighbourhood and, as indicated in the theoretical discussion of Chapter Two, the two may be extremely closely linked. Beyond this, a critic of the assertion that schools (or neighbourhoods) do largely determine the stream in which a student is placed, could interpret the data of Table 3.4 in a different way. This critic might argue that schools play an entirely passive role; that instead, influenced by their parents, children who come from more affluent neighbourhoods work harder to enter the five-year stream. In this interpretation, all schools do is accede to these student and parental wishes, unavoidably at the expense of pupils from less affluent neighbourhoods.

Student Wishes

Data with which to test this interpretation may be found in the "intention studies" of Breton (1972), Porter, et al (1973), Anisef (1976)

and among the data collected in the Carnegie Study. Breton reports that 66.5 per cent of all Canadian high school boys wish managerial or professional jobs and that this percentage for Ontario boys drops only to 54 if the occupational status of the father is "low" and only to 50 if the mental ability rank of the child is low. Breton found that 59 per cent of families with low occupational status wish their male children to continue their education beyond high school. Anisef reports for Grade 12 students that 66 per cent of the males and 72 per cent of the females aspire to jobs which require university-level training and 58 and 57 per cent respectively expect to get these jobs. In contrast, only 30 per cent of fathers of these Grade 12 youngsters had such occupations. Porter and Blishen report, by socio-economic status of parents, the per cent of Grade 8 students in Ontario wishing to graduate from university (see Table 3.5).[11] Data collected in 1959 as part of the Carnegie Study show that 37 per cent of Grade 9 boys and girls in Metropolitan Toronto wished professional or executive positions while less than one per cent wanted to become unskilled labourers. (Detail is presented in Appendix Table 3.3.)

In summary, it seems very likely that the percentage of students who actually receive Grade 13 diplomas is substantially lower than is desired by parents or students.[12] The tentative conclusion thus follows

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11 Gilbert (1973) offers explanation of variations in aspirations among students but, in doing so, pays scant attention to the influences of supply of places in the educational system.

12 In OSSTF (1976), one finds that parents and students as against principals and teachers answered the following questions differently:

Percentage who said they agreed among:

	Students	Parents	Teachers	Principals
a. An early school-leaving policy should be adopted	38	35	79	90
b. Primary responsibility of secondary schools is to prepare students for further formal education	75	84	57	56
c. Some homework should be expected most nights in virtually every course	75	84	59	61
d. Each secondary school should have a community advisory committee to assess programs from perspective of parents	80	75	50	42

Table 3.5 Percentage of Grade 8 Students by Mental Ability who Aspire to Graduate from University

Socio-economic Status of Parents	All Students	Students with High Mental Ability Only	
		Male	Female
High	61%	75%	68%
Middle	43%	58%	50%
Low	29%	49%	31%

Source: Porter, et al (1973), pp. 71 and 127

that schools keep this percentage from rising to desired levels. Nonetheless, a critic could argue that if students were able to achieve their hopes, the occupational distribution of the labour force by educational attainment would have to be radically changed -- and this is not possible. All the schools are doing is making parents and students face reality. However, comparisons of the percentage of young people who do enrol in university in the USA, in Japan, or in Russia with the percentage for Ontario or Canada renders this assertion implausible, especially since financial assistance for university students in the form of subsidized loans and bursaries is liberal in Ontario and because the Canadian academic year is relatively short, which implies that summer earnings for university students could be relatively large. Further, Porter and Blishen discovered that over 80 per cent of all parents and over 70 per cent of poor parents would be willing to help support their children in a post-secondary education.

There is a more direct objection to the view that all the schools are doing is transmitting "reality" to students and parents. Suppose that society, in some sense, would prefer that students be selected and trained for professional and executive positions on the basis of their scholastic aptitude scores in Grade 9, what then would the results be? An answer is found in Table 3.6. The first column shows the percentage of students, by father's occupation, who satisfied what may be viewed as a "necessary condition" for obtaining a professional or executive position, namely a Grade 13 Diploma. The second column shows what would happen if a cut-off of 60 on the Grade 9 scholastic aptitude test were added as a second necessary condition. The two conditions taken together are met by 18.8 per cent of the entire Grade 9 cohort.

Table 3.6

Grade 9 Students Who Desire a Professional or Executive Occupation and Who Display High Scholastic Aptitude by Father's Occupation, Metropolitan Toronto, 1959

Number of students by father's occupation	% who received Grade 13 diploma	% who scored 60 or more on CAAT*	% who received Grade 13 diploma of all who scored 83 or more on CAAT*
Unskilled labour (831)	48.0	47.1	39.3
Skilled labour (1109)	54.6	49.1	43.9
Clerical (757)	61.8	55.7	51.4
Salesman (661)	61.0	52.3	53.3
Small business (560)	63.8	53.0	56.5
Executive (1176)	67.1	53.7	62.1
Professional (762)	74.3	60.4	77.3
Other (837)	56.8	46.5	42.7
Don't know (243)	79.0	38.7	43.1
ALL	61.2	51.5	51.5

* Assuming a normal distribution.

18.8 per cent is a crude forecast of future demand for professionals and executives. In contrast, the last column shows the percentage of pupils, disregarding their stated occupational desires, who both scored high in scholastic aptitude and received Grade 13 diplomas. The scholastic aptitude cut-off was chosen so that the totals of the second and third columns would match. As expected, it is easier for children from more affluent homes to satisfy their desires.

As a tentative conclusion: schools (and neighbourhoods) do stream students away from university and not on academic criteria alone. First, by treating all students "equally" in terms of the resources devoted to teaching them to read, the absolute gap in reading ability between students whose parents are in high occupational groups and students whose parents are poor is increased. Second, even though one accepts reading ability as displayed in Grade 8 as the result of events which can no longer be changed, schools in more affluent neighbourhoods do put more youngsters into the five-year stream than would go there if parental occupation and scholastic ability were all that mattered, and conversely. But I have anticipated data which are still to be presented.

CHAPTER FOUR

GRADE 9 SCHOLASTIC APTITUDE AND GRADE 13 DIPLOMA

The only reasonably complete study of what happens to Ontario students during their secondary school years is the Carnegie Study which covers the years 1959-64. For more recent years, I must rely on data from public schools in the City of Toronto and data collected by the Ministry of Education (sketchy data for 1967 and fuller data for 1971-72). To a limited extent, I may be able to transfer knowledge obtained from analysis of Carnegie data to a more recent period.

Many school boards have computerized their student records and could monitor their secondary schools at very low cost but do not appear to do so. The City of Toronto Board, for example, has a computerized system and assigns each student a number which stays with the student until he/she leaves the City school system. Hence, it would be simple to follow students who remain in the system as they pass from one grade to the next through secondary school. It turns out, however, that each year's computer tape is destroyed at the end of the year. Several years ago, Dormer Ellis (1968) did collect data from individual schools for 3,350 Grade 13 students to see if students who skipped grades were thereby helped or handicapped. Her results are, however, not useful for our purposes since she did not collect information on students who left school before reaching Grade 13. [13]

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13 Her data show that 45% of Grade 13 students had fathers in professional, executive or administrative jobs (Table IV).

From some secondary schools and programs, a very high proportion of students will reach Grade 13, receive Honours Diplomas and, in most cases, continue into university; from others, most students will leave school after their Grade 12 Diploma; from still others, virtually all students will drop out at the school-leaving age of sixteen. For public schools in Metropolitan Toronto, some estimates are provided in Table 4.1 for the period 1959-64. (Appendix Table 4.1 contains a coded list of schools grouped according to the categories used in this table. This list provides implicit definitions of the groups used in the tabulations and should be compared with Table 3.2 above.) For a more recent period, somewhat comparable data are presented in Chapters Six and Seven.

Incidentally, for 1959-64, the province-wide Grade 13 diploma rate (from Grade 9) was 15 per cent. Since the Metro Toronto rate was then 22 per cent, the rest of the province outside Metro had a diploma rate of about 13 per cent. Perhaps one motive for migrating to Toronto (and other large cities) is the increased probability that one's children will thereby receive more schooling and go on to university.

To analyze what happens to students in secondary school, I begin with the assumption that secondary schools have little control over education in the first eight grades and simply accept the combined judgment of Grade 8 teachers as to the secondary school program best suited to each student. Of course, secondary schools do not need to accept these judgements; they could administer their own placement tests instead, although that would be an onerous task. Once assigned to a particular program, a student does have an opportunity to change, e.g., from a four-year commercial program to a five-year academic program, but no reliable data on the extent of program changing seem to be available, and, recently, the Ministry's HS-1 has made fuzzy the edges of the traditional programs or streams.

Table 4.1

Groups of Metro Schools, 1959-64

	Number of Schools	Enrolment in Grade 9	% who Enrolled in Grade 13	% who Received Grade 13 Diplomas
City of Toronto (Public)				
Rich neighbourhood	4	784	63	53
Middle "	9	2708	42	29
Poor "	12	3030	7	2
Sub-total:		6522	28	19
Other Boroughs (Public)				
Rich neighbourhood	6	1413	47	36
Middle "	9	2475	39	28
Poor "	23	6179	26	17
Sub-total:		10067	32	22
Catholic	14	1903	33	23
Private (not Catholic)	18	488	54	48
Totals:	95	18980	31	22

N.B. Grade 13 enrolments and number of diplomas relate to the original Grade 9 population regardless of where in Ontario they completed their secondary school education, i.e., not included are students who came to Metro after Grade 9 and not included are Grade 9 Metro students who left Ontario before Grade 13 even though they did so after Grade 12 to attend university in other jurisdictions.

The Carnegie data suggest that program changing was relatively rare.[14a] More recent impressionistic data suggest the same thing.

Secondary School "Errors"

In judging the performance of secondary schools, I define two "errors" that our society and its schools could make: Type I is the error of awarding a Grade 13 diploma to a youngster who, in terms of scholastic ability, should have stopped his/her formal education with a Grade 12 diploma; Type II is the error of denying a Grade 13 diploma to a student who, by the same criterion, should continue into university. These "errors" were partly anticipated in Table 3.6 above and data in the Carnegie Study permit reasonably good estimation of them. (Scholastic aptitude test scores were obtained from about 90 per cent of all students in Grade 9.) It is thus possible to sort students by aptitude test scores as well as by sex, by school and by father's occupation.

Start with the data found in Table 4.2.[14] Over 40 per cent of high scholastic aptitude youngsters did not receive Grade 13 diplomas and 15 per cent dropped school before Grade 12. In short, Type II errors were, during the Carnegie period, very large. In contrast, Type I errors were relatively small, except for youngsters from executive and professional families; overall, only 8 per cent of youngsters with low scholastic aptitude scores stayed in school through Grade 13 and obtained diplomas.

14a Coding and card punching of "program" in the Carnegie Study were, however, inadequate and, in most cases, no distinction was made between four and five-year academic programs. Changing schools was, however, fairly common during the Carnegie period and presumably still is. At that time, over 20 per cent of all secondary school students in Metro Toronto changed schools, mostly I suppose because their parents moved from one part of Metro to another. One school may be sufficiently different from another so that what amounts to a program change will accompany a school change but not be so recorded. One simply does not know.

14 For Ontario retention rates see Appendix Tables 4.2.

Table 4.2

Retention of Students by Grade 9 Scholastic Aptitude Test Scores and by Father's Occupation, Metropolitan Toronto, 1959-64

	Number in Grade 9	% Reached Grade 12	% Received Grade 13 Diploma
Score of 80 or More			
Executive and professional (Male)	594	89	68
(Female)	407	91	68
Clerical, Salesman, Small Business (Male)	622	86	59
(Female)	386	88	58
All Other Occupations (Male)	881	77	45
(Female)	509	83	48
Sub-total (Male)	2097	83	56
(Female)	1302	87	57
Score of 60-80			
Executive and professional (Male)	555	76	34
(Female)	470	80	47
Clerical, Salesman, Small Business (Male)	719	72	29
(Female)	561	73	35
All Other Occupations (Male)	1430	63	19
(Female)	1188	61	25
Sub-total (Male)	2704	67	25
(Female)	2219	68	32
Score of Less Than 60			
Executive and professional (Male)	503	50	12
(Female)	610	58	18
Clerical, Salesman, Small Business (Male)	943	45	9
(Female)	1004	44	9
All Other Occupations (Male)	2624	41	6
(Female)	2991	34	6
Sub-total (Male)	4073	44	7
(Female)	4605	40	8

(Table 4.2 continued)

No or Incomplete Score		Number in Grade 9	% Reached Grade 12	% Received Grade 13 Diploma
Executive and professional	(Male)	143	71	28
	(Female)	123	57	29
Clerical, Salesman, Small Business	(Male)	176	56	13
	(Female)	167	44	13
All Other Occupations	(Male)	739	36	7
	(Female)	635	27	7
Sub-total	(Male)	1072	44	11
	(Female)	925	34	11
All Scores				
Executive and professional	(Male)	1795	73	39
	(Female)	1610	73	40
Clerical, Salesman, Small Business	(Male)	2460	64	28
	(Female)	2118	60	25
All Other Occupations	(Male)	5674	49	16
	(Female)	5323	44	14
Total	(Male)	9929	58	23
	(Female)	9051	53	21

N.B. A few diploma rates may be fictitiously low because some students leave school after Grade 12 for universities outside Ontario.

A good student may perform poorly on aptitude tests, especially if marks are not affected; it is unlikely that a poor student will perform well.

In reading the table, notice three other phenomena: (1) Invariably, and as expected, youngsters from more affluent homes performed better on these tests (at least 29 per cent of youngsters had top scholastic aptitude scores; the comparable percentage for the bottom occupational group was only 13). (2) Diploma rates for these richer youngsters - even when one controls for scholastic aptitude - were substantially higher than were the rates for youngsters from poor families. (3) In every occupational group, the percentage of girls who performed well on these aptitude tests was much lower than the percentage of boys [15] (16 per cent of girls were in the top scholastic aptitude group; the comparable percentage for boys was 24). Notice, however, that the difference between boys and girls narrows with the affluence of parents.

This sex difference was unexpected for the age group and is not found in parallel data from Sweden, Australia or U.S.(Keever, 1972). Either the tests used in the Carnegie Study are sex-biased in the choice of items (or weighting procedures) or families and schools in Metro Toronto discriminated against girls at relatively early ages. Since many of the test items were taken from U.S. sources,[16] relatively more sex discrimation in Ontario seems the more likely explanation. Minor confirmation of this explanation comes from the fact that the number of females emigrating to the U.S. from Canada exceeds the number of males and female/male earnings ratios are higher in the U.S. Jews also emigrate from Canada to the U.S. in numbers which greatly exceed their share of

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15 The overall sex ratio of 91 girls to 100 boys in Grade 9 seems strange but a closely similar ratio is found also in the 1961 Census and total enrolments from the Carnegie Study for public schools match enrolment figures from Ministry of Education reports.

16 See Sixth Mental Measurements Yearbook, pp. 698-699.

the Canadian population. In both cases, perhaps the emigration is in search of less discrimination.

In Tables 4.3, comparable data are presented by school group for youngsters with high and with low scholastic aptitude scores. (See also Appendix Tables 4.3.)

Table 4.3a

Percentage No Diploma by Father's Occupation and School Group for Students who Scored 80 or More on Grade 9 Scholastic Aptitude Tests, Metro Toronto, 1959-64

School/Sex	Professional & Executive	Clerical Salesman & Small Business	All other* Occupations	Total	Sex Ratio (f/m)
Toronto public - rich					
Male	30	22	39	28	.88
Female	24	27	28	25	
Toronto public - middle					
Male	28	48	46	43	.60
Female	33	33	38	36	
Toronto public - poor					
Male	100	83	88	88	.40
Female	100	100	89	92	
All Toronto public					
Male	30	44	60	49	.63
Female	28	39	48	40	
Other Metro public - rich					
Male	38	43	56	43	.68
Female	23	34	42	30	
Other Metro public - middle					
Male	26	35	45	35	.71
Female	38	44	51	44	
Other Metro public - poor					
Male	38	44	58	50	.60
Female	36	45	59	50	
All other Metro					
Male	34	41	55	45	.65
Female	32	43	55	44	
Catholic - Male	43	41	37	40	.49
Catholic - Female	40	53	57	37	
Private** - Male	24	32	17	25	.55
Private** - Female	35	30	41	45	
All Schools					
Male	32	41	55	44	.62
Female	32	42	52	43	
Sex Ratio (Female/Male)	.69	.62	.58	.62	

* "All other occupations" includes the following Carnegie categories: unskilled labour, skilled labour, farmer, other, and don't know.

** Private and not Catholic

N.B. Scholastic aptitude scores are in "percentile rank" for all Ontario students, e.g., a score of 50 means that half the students did better than this, etc.

Table 4.3b

Percentage Diploma by Father's Occupation and School Group for Students Who Scored Less than 60 on Grade 9 Scholastic Aptitude Tests, Metro Toronto, 1959-64

School/Sex	Professional & Executive	Clerical Salesman & Small Business	All Other* Occupations	Total	Sex Ratio (f/m)
Toronto public - rich					
Male	21	18	20	19	1.00
Female	33	27	26	29	
Toronto public - middle					
Male	11	13	9	10	.84
Female	22	9	13	14	
Toronto public - poor					
Male	5	2	2	2	.91
Female	3	0	-	4	
All Toronto public					
Male	12	9	5	6	.89
Female	21	8	5	7	
Other Metro public - rich					
Male	14	16	12	14	1.32
Female	20	18	9	16	
Other Metro public - middle					
Male	16	10	7	9	1.44
Female	13	12	5	9	
Other Metro public - poor					
Male	9	7	5	6	1.08
Female	11	8	6	7	
All other Metro					
Male	12	9	6	7	1.17
Female	14	10	6	8	
Catholic - Male	12	7	10	12	1.87
Catholic - Female	18	8	8	10	
Private - Male	18	12	0	14	2.61
Private - Female	28	7	22	23	
All - Male	12	9	6	7	1.13
All - Female	18	9	6	8	
Sex Ratio (Female/Male)	1.21	1.06	1.14	1.13	

For those who believe in "equality of opportunity", the numbers in these tables may be shocking. In the public schools, except in a few cells where the number of observations are few and from which students could have left Ontario, youngsters whose parents are executive or professional have lower "no diploma" rates and higher diploma rates than do youngsters whose parents are in "other" occupations. Looking at the lower no diploma rates in wealthy neighbourhoods, one suspects that house values there are high in part because parents know that living in these neighbourhoods will help their children reach university, especially if their children are not academically strong. Remember in this connection that Grade 13 diplomas were given during the Carnegie period for successful completion of at least six Province-wide, competitive exams for which a school (and parents) could prepare their youngsters.

Students of Middle Scholastic Ability

We have just seen how students at the top and bottom of the scholastic aptitude scale fared in Metro schools. Turn now to the roughly 30 per cent of students who fell in the middle range of scholastic aptitudes (scores between 60 and 80). For analysis of these students, I performed an imaginary experiment. Suppose that youngsters attending Toronto public schools were put in Catholic schools instead, where the "diploma rates" by father's occupation and scholastic aptitude are somewhat different, would more or fewer then earn diplomas? The results of this conceptual experiment are reported in Table 4.4 for each group of schools. To illustrate how to read the table, take the row labelled "Toronto middle". The first percentage (55) shows what the overall diploma rates for students enrolled in this group of schools would have been if the diploma rates found in "rich Toronto" public schools had applied; the second percentage

Table 4.4

What Grade 13 Diploma Rates Would be if Students Who Scored Between 60 and 80 on Scholastic Aptitude Test in Grade 9 had Attended a Different School, 1959-64

School Group	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1) Toronto-rich	73	62	7	64	55	47	69	71
2) Toronto-middle	55	34	4	33	30	22	36	38
3) Toronto-poor	54	31	4	30	29	20	35	36
4) Other Metro-rich	59	36	4	38	32	27	40	39
5) Other Metro-middle	34	34	5	34	31	24	37	37
6) Other Metro-poor	56	34	5	38	30	22	36	37
7) Catholic	58	37	5	33	32	24	35	37
8) Private	53	38	2	38	34	22	36	44

N.B. Differences of a few percentage points should be disregarded.

is "middle Toronto's" own rate, etc.

The particular mixture of students attending "Toronto-rich" public schools would have the highest diploma rate no matter where they went. But the figures in the table suggest that "Toronto-rich" schools would serve better the wishes of students attending every other group of schools but one - if we interprete student "wishes" as a desire for a Grade 13 diploma. Notice also that (again using diploma rates as the criterion) both Catholic and Private schools would serve better the wishes of every group of students, except the first, than do the schools where they actually were enrolled.[17]

From Table 4.4., students in "Toronto-poor" schools appear to be extremely ill-served by their schools, with "Other Metro-poor" coming a distant second from the bottom. In City of Toronto public schools, however, program goes with school but this is not the case in the other boroughs. Hence, in the case of Toronto, one should treat the entire public system as if it were a single school. This is done in Table 4.5. In this comparison, public schools are seen to serve middle aptitude female students better than they serve male students, and conversely for Catholic schools. These comparisons should, however, be treated with care; if large numbers of students actually were to change schools, the diploma rates shown in these tables would not predict very well.

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17 Notice that in four cases an "index number problem" does arise. For example, Toronto-middle students did better in (2) than in (4) while students in (4) did better than they would have in (2). And, for Catholic students, (2) is better than (7) while, for students in (2), (7) is better than (2). Of course, with data for only one group of students this problem could be an illusion.

Table 4.5

What Grade 13 Diploma Rates Would be if Students Who Scored Between 60-80 on Scholastic Aptitude Tests had Attended a Different School System, 1959-64

		(1)	(2)	(3)
(1)	All Toronto public	24/32	22/30	39/35
(2)	All other Metro public	25/31	23/31	39/35
(3)	Catholic	28/33	25/31	37/33

N.B. Male rate above diagonal; female rate below it.
Private schools were omitted because too few (124) students in them fell in the 60-80 range of scores for a meaningful sex separation.

Parallel rates for all students

		(1)	(2)	(3)	(4)
(1)	All Toronto public	27	25	36	43
(2)	All other Metro public	30	27	37	40
(3)	Catholic	31	28	35	37
(4)	Private	40	33	36	44

Possible Difficulties

The data underlying the tables just presented start with Grade 9 students, sorted by sex, school, scholastic aptitude score, and father's occupation, and then each subgroup was divided into two groups: those who received Grade 13 diplomas and those who did not. Between Grade 9 and Grade 13, however, father's occupation could change and so could the school attended. Nonetheless, the diploma rate was associated with the Grade 9 school and the father's occupation at that time, regardless of what changes may have taken place subsequently. In consequence, some of the results just reported could be misleading. Although the Carnegie Study only recorded father's occupation once (in Grade 9) for each student, one may infer that a move from a school in a poor neighbourhood to one in a better neighbourhood would usually accompany an improvement in familial circumstances. Nonetheless, no pattern of school switching by father's occupation was observable. Generally speaking, diploma rates were substantially lower for students who switched secondary schools than for those who did not, with the prominant exception of students who moved from schools labelled "Toronto-poor" and for some students who had low scholastic aptitude scores in Grade 9. Appendix Table 4.4 summarizes the "from-to" data by groups of schools, arranged in descending order of overall diploma rate.

Notice that students who changed schools within the same group or who moved to a school (and neighbourhood) with a lower diploma rate invariably did worse (in the sense of diploma rate) than those who did not move. One might guess that those who moved up would, in contrast, display diploma rates falling between the rates of those who did not move - in origin and in destination schools. And this was true in four out of the seven possible cases. Why the hypothesis is denied by youngsters "moving up" from Private, Catholic and Other Metro-rich schools is not clear.

It could be that some students who performed poorly in Private or Catholic schools were moved out since tuition fees are charged in these schools.

A second source of error could be the absence of scholastic aptitude scores for some students. This is unlikely, however, as the data found in Table 4.2 suggest. More likely as a source of error is misreporting or absence of reporting of father's occupation. In the computations behind the diploma rates lies an assumption that a given father's occupation has the same definition in each school, an assumption which is probably false. It seems doubtful, however, whether errors thus introduced would -- if they could be removed -- change the direction of the data.

A third source of error could come from lumping together students whose parents speak English at home with those whose parents do not. 13 per cent of the Carnegie cohort learned English as a second language. Many of them performed poorly on Grade 9 scholastic aptitude tests (especially the verbal portion) but did better as they proceeded through secondary school. Appendix Table 4.5 provides detail. With the minor exception of schools attended by children from affluent homes, diploma rates for students who did not speak English at home were significantly higher for every category but, as expected, the percentage of these youngsters who performed well on the Grade 9 scholastic aptitude tests was lower. The overall diploma rates for those who did and those who did not speak English at home were, however, nearly the same, a result traceable to the different occupational distribution of fathers of the two groups and consequent differences in residential patterns. (21 per cent of families who spoke English at home were professional or executive in character; the comparable percentage for families who did not speak

English at home was 8.) Along with this, over half of the youngsters for whom English was a second language were found in poor or middle-class public schools in the City of Toronto whereas the parallel figure for children from English-speaking homes was 26 per cent. Perhaps immigrant families are forced by discrimination into lower occupational positions than they held in their countries of origin and this explains their children's higher diploma rates. Or immigrant families may be more desirous of upward social mobility for their children and are sure that schooling is important for this objective (Goldlust and Richmond, 1974).

Pretty much the same picture is displayed if one starts with students who have managed to reach Grade 13 (see Table 4.6).[18] In two-thirds of the groupings displayed in the table, students who speak English at home have lower diploma rates, but their overall diploma rate is higher. This is expected since 30 per cent of the English-speaking students come from professional or executive families whereas the comparable percentage for those who do not speak English at home is 9. In consequence, 45 per cent of the non-English speaking group attended schools in middle-class or poor neighbourhoods in the City of Toronto; the parallel percentage

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18 In this table, students are sorted according to the school they attended in Grade 13 rather than the school attended in Grade 9. Hence, in comparison with earlier tables, students who moved to Metropolitan Toronto from elsewhere in the Province during their secondary school years are included.

Table 4.6

Diploma Rates for Students in Grade 13 by Father's Occupation, School, Language Spoken at Home, Metro Toronto 1962-64

School	Professional & Executive		Clerical, Salesmen Small Business		All Other Occupations		Total	
	English	Other	English	Other	English	Other	English	Other
Toronto public - rich	86 (198)	83 (6)	79 (182)	91 (11)	74 (146)	79 (33)	80 (526)	82 (50)
" " - middle	67 (175)	75 (28)	56 (235)	67 (49)	59 (418)	61 (246)	60 (828)	63 (323)
" " - poor	20 (10)	0 (2)	12 (26)	36 (11)	13 (80)	35 (89)	10 (116)	34 (102)
All Toronto Public	76 (383)	72 (36)	63 (443)	66 (71)	57 (844)	57 (368)	64 (1460)	59 (475)
Other Metro public - rich	80 (375)	79 (14)	76 (230)	100 (6)	73 (165)	79 (28)	78 (770)	81 (48)
" " " - middle	64 (222)	75 (8)	61 (193)	35 (23)	46 (256)	55 (38)	57 (671)	51 (69)
" " " - poor	71 (349)	71 (17)	67 (626)	85 (52)	60 (841)	66 (198)	65 (1816)	70 (267)
All Other Metro public	73 (946)	74 (39)	68 (1049)	72 (81)	59 (1262)	66 (264	66 (3257)	44 (596)
Catholic	78 (98)	88 (8)	75 (120)	77 (13)	80 (141)	76 (55)	78 (359)	78 (76)
Private	78 (206)	60 (5)	56 (41)	0 (2)	63 (38)	43 (7)	73 (285)	43 (14)
All Schools	75 (1633)	74 (88)	67 (1653)	69 (167)	60 (2085)	62 (694)	67 (5371)	64 (949)

N.B. Numbers in parentheses are numbers of students.

for English-speaking youngsters was 18.[19]

Overview

A more substantive objection to my interpretation of the data will come from those who have little confidence in scholastic aptitude tests on grounds that test scores are not strongly related to marks assigned by teachers or to subsequent career or job performance (Hause, 1971). One could also argue that every occupation needs smart people, not only the professions and executive cadre. Finally, suppose one accepts as a fact that family background, regardless of performance in schools, does determine for most children their adult position in the society. Then it follows that those youngsters who are thereby pre-selected for important positions should be well educated, almost regardless of their scholastic aptitude. Critics holding such views will not be much disturbed or interested in the diploma rates for some school and occupational groups reported above.

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19 Data from Wright (1971) confirm this finding as the table below indicates.

Percentage of secondary school students in 5-year programmes by place of birth, parental occupation and mother tongue, City of Toronto Public Schools, 1970

Parental occupation*	English is mother tongue		English is not mother tongue	
	Born in Canada	Not born in Canada	Born in Canada	Not born in Canada
Categories 2,3, 11,13,14 (low)	39	45	66	45
Categories 4,5, 6 (middle)	60	50	77	64
Categories 8,9 (high)	85	84	83	84
All occupations	57	57	71	51

* See Table 3.3. above

Readers who adopt a more egalitarian posture, in the sense of "equality of opportunity", will be disturbed. They will see the differences in diploma rates and the weak correlations just mentioned as evidence of a society that is performing poorly -- unless one adopts the position that families who already have obtained positions of power are more likely to exercise power with a true sense of public responsibility than will other claimants.

I conclude this section with a summary table which compares the percentage of students who did receive Grade 13 diplomas by father's occupation and sex with the percentage who would have received diplomas if Grade 9 scholastic aptitude had been the decisive factor (see Table 4.7). The total number of diploma recipients has been held constant for both sexes combined in the next to the last column and for each sex separately in the last column. The school system (perhaps as a reflection of neighbourhood pressures) appears to be "biased" in favour of children from more affluent homes and in favour of female students. Remember, however, that the number of male actual diploma holders from executive and professional homes may be fictitiously small because some of these youngsters were sent outside Ontario for university after Grade 12. Remember also that the scholastic aptitude tests administered in Grade 9 do favour children from more affluent families since such children have been better prepared by their home environments and elementary schools to perform well on these tests. Finally, remember that the actual diploma recipients counted in the table contain many students who displayed low scholastic aptitude in Grade 9 whereas the "inferred" diploma recipients consist only of high aptitude youngsters.

Table 4.7

Actual and "Inferred" Grade 13 Diploma Recipients,

Metro Toronto, 1959-64

Father's Occupation	Original Grade 9 Cohort		Actual Diploma Recipients		"Inferred" Diploma Recipients (Total Both Sexes Held Constant)		(Total Each Sex Held Constant	
	Number	%	Number	%	Number	%	Number	%
Executive and Professional								
Male	1795	18	692 (39)	31	684 (38)	27	627 (351)	28
Female	1610	18	640 (40)	33	483 (30)	29	541 (34)	28
Clerical, Salesman and Small Business								
Male	2460	25	682 (28)	30	738 (30)	29	665 (27)	29
Female	2118	23	535 (25)	28	476 (22)	29	547 (26)	28
All Other Occupations								
Male	5674	57	883 (16)	39	1112 (20)	44	965 (17)	43
Female	5323	59	762 (14)	39	701 (13)	42	849 (16)	44
Total								
Male	9929	100	2257 (23)	100	2534 (26)	100	2257 (23)	100
Female	9051	100	1937 (21)	100	1660 (18)	100	1937 (21)	100
Both Sexes	18980		4194		4194		4194	

N.B. Diploma rates in parentheses.

That so many students with relatively low aptitude passed the six Province-wide examinations required for a Grade 13 diploma, particularly from rich neighbourhoods, suggests that students could prepare for them through hard work and memorization (Frye, 1962). That so many youngsters with high scholastic aptitude did not pass these examinations is because they did not sit for them; they stopped with Grade 12 or sooner, having been placed in programs (and schools) which did not lead into Grade 13.

Schools and neighbourhoods receive children, some of whom have been academically inclined by their parents through early childhood training while others have not. This early sorting is not much changed as children pass through elementary and secondary schools, regardless of the professional aspirations of an increasing proportion of all youngsters. Many potentially scholastically gifted youngsters in the Metro Toronto public schools were excluded from five-year academic programs in Grade 9, or so the data suggest.

CHAPTER FIVE

MARKS, GRADE 12 SCHOLASTIC APTITUDE AND DIPLOMAS

Great weight was placed in the last chapter on the results of three Grade 9 scholastic aptitude tests. What about the parallel aptitude tests administered in Grade 12? What about marks given by teachers?

Scholastic Aptitude

To find out, I start with a comparison of the two sets of aptitude tests (40 per cent of the students in the Carnegie Study reached Grade 12 and took both sets of tests). In Table 5.1 are recorded, by sex and for each group of schools, the number and percentage of students who performed the same, better, or worse in Grade 12 than in Grade 9.[20] Also recorded are the diploma rates for each resulting subgroup of students. The table has too many numbers for easy understanding without guidance. Consider the following:

(1) Compare the percentage who performed the same or better on the Grade 12 tests than on the Grade 9 tests. In Toronto public schools in rich neighbourhoods there are six such percentages for male and six for female pupils. In each case, as expected, pupils who subsequently received Grade 13 diplomas performed better than those who did not. Throughout the entire table there are only three minor reversals of this relationship. But the reason for this regularity is not clear.

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20 The aptitude scores on both tests are in "percentile rank" and many of those with low CAAT scores did not reach Grade 12. "Doing the same" on both tests is defined as falling in the same bracket, e.g. a score of 68 on both sets of tests would put the pupil in the 60-80 score bracket on both tests. Hence, "doing the same" is really an improvement since the Grade 12 population is scholastically better equipped.

Table 5.1

Change in Scholastic Aptitude Scores and Diploma Rates by School Group, Sex, and Grade 9 Scores, Metro Toronto, 1959-64

	Scored 80 or more on Grade 9 Scholastic Aptitude Tests					Scored 60-80 on Grade 9 Scholastic Aptitude Tests					Scored less than 60 on Grade 9 Scholastic Aptitude Tests				
		% Scoring Same		Diploma Rate			% Scoring Same or Higher		Diploma Rate			% Scoring Higher		Diploma Rate	
	Number of Students	If no Diploma	If Diploma	If Worse	If Same	Number of Students	If no Diploma	If Diploma	If Worse	If Same or Better	Number of Students	If no Diploma	If Diploma	If Same	If Better
Toronto public - rich															
male	118	54	70	84	91	67	50	60	75	82	29	7	36	39	83
female	118	24	40	75	86	98	49	60	70	83	47	10	26	53	78
Toronto public - middle															
male	215	30	44	76	85	232	36	60	42	66	146	18	19	35	37
female	144	33	41	75	81	186	39	46	64	70	146	10	24	38	65
Toronto public - poor															
male	51	41	64	19	38	103	57	47	22	16	162	18	25	11	16
female	30	46	75	7	20	62	39	57	6	10	135	15	33	2	5
All Toronto public															
male	384	38	54	70	82	402	46	59	42	55	337	18	23	24	31
female	292	34	41	69	75	346	43	50	55	63	328	13	25	25	43
Other Metro public - rich															
male	170	20	59	58	89	123	43	64	43	64	70	16	4	28	59
female	128	26	50	72	88	135	38	55	58	73	121	13	14	35	38
Other Metro public - middle															
male	249	35	56	74	87	193	30	66	34	70	94	17	17	32	31
female	174	19	46	61	85	216	43	58	45	61	179	17	20	22	26
Other Metro public - poor															
male	412	31	54	59	79	407	44	71	25	51	356	13	20	21	31
female	173	27	48	54	75	387	39	49	38	49	441	17	16	22	20
All Other Metro public															
male	831	29	56	63	84	723	40	68	30	58	520	14	23	24	37
female	575	25	48	60	81	738	40	53	44	57	741	17	16	24	24
Catholic															
male	147	27	48	65	82	151	40	60	41	62	133	7	21	25	53
female	66	12	48	65	92	115	20	47	42	72	160	7	31	30	72
Private															
male	95	100	78	100	91	36	55	64	64	73	6	50	-	80	-
female	57	11	51	54	91	48	36	54	46	64	47	4	14	42	75
All Schools															
male	1457	33	56	66	84	1352	42	66	36	60	996	14	22	25	36
female	1290	26	46	63	80	1239	39	51	47	61	1276	14	21	26	36

N.B. Diploma rate for students who took both Grade 9 and Grade 12 Scholastic aptitude tests.

In consequence of improving their scholastic aptitude, perhaps students decided to stay in school and obtain the Grade 13 diploma. Or perhaps students who found themselves in the 5-year academic stream were, for that reason, more likely to improve their aptitude scores. In my reading, the weight of the evidence favours this second explanation. For instance, a larger fraction of students in the richer neighbourhoods were in the 5-year stream as is shown by the higher diploma rates for these schools (with the one exception of "Other Metro-rich" from which Appendix Table 1 suggests that an unusually large percentage of students left after Grade 12 for university outside Ontario). And students in this stream did receive higher marks from their teachers as is reported later.

(2) Girls started out with lower scholastic aptitude scores in Grade 9 than boys and ended up in Grade 12 with still lower scores.[21] In 70 per cent of the cases found in the table, girls improved their scores less than boys and half of the reversals are for students who did very poorly on the Grade 9 aptitude tests and could have learned English as a second language. In most cases, as expected, the diploma rate for girls is also slightly lower than for boys.

The data in Table 5.1 on diploma rates confirm evidence presented earlier: the richer the neighbourhood, the higher the diploma rate. Here this fact is associated with schools; earlier it was associated with father's occupation as well as schools and the question still remains whether neighbourhood and school influences can be separated one from the other. In search of a way of untangling one influence from another, Appendix Table 5.1 was constructed.

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21 From U.S. data, girls also perform on such tests below boys but there this sex difference appears to be less than in Toronto. American College Testing Program (1972, p.128) found average scores for students 18-20 years to be 18.1 for males and 17.4 for females. Both the SAT tests and the comparable US tests could be biased against females but was not intended and direct evidence does not seem to be available.

But no clear pattern is to be seen beyond what is sociologically obvious: boys improved aptitude scores more than did girls and so did students who were in the Grade 13 stream and got diplomas. But if there is no clear pattern by father's occupation, then the school-neighbourhood influence displayed in Table 5.1 remains intact.

Marks

Next turn to marks and the data found in Table 5.2. There one can see that in Grade 9 (and controlling for scholastic aptitude) girls received higher marks from teachers than boys and that students who subsequently received Grade 13 diplomas also received higher marks. And, as expected, higher marks did go to pupils with higher scholastic aptitude (although the correlation between the two is not terribly high). These same phenomena are found when students are sorted according to their displayed scholastic aptitude in Grade 12.[22]

To explain these results, I must speculate (Williams, 1972). We know that the correlation coefficients between Grade 9 average marks and either of the scholastic aptitude tests just mentioned are lower than the correlation coefficients between Grade 9 marks and teachers' perception of student traits such as "industry", "reliability", "cooperativeness" (roughly speaking, the coefficients are about .3 and .5 respectively). It seems likely that girls are brought up to incorporate and display these traits more than are boys. In this same vein, is it possible that a child who is trained to live in a world where she will experience discrimination as an adult will be discouraged from reasoning

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22 This pattern of girls scoring lower on scholastic aptitude tests in Grade 12 but receiving higher marks is found also in U.S. data but the differences may be less extreme than those recorded in the Carnegie Study, Ibid, p. 127, for example.

Table 5.2

Average Mark Given by Teacher in Grade 9 by Scholastic Aptitude, Sex and Diploma, Metro Toronto, 1959-64

Grade 9 Scholastic Aptitude Score	No diploma		Sex Ratio	Diploma		Sex Ratio
	Male	Female	(f/m)	Male	Female	(f/m)
Less than 40	53.5	56.8		69.0	67.8	
(number)	(1383)	(1890)	1.37	(44)	(64)	1.45
40-60	57.6	61.5		69.3	71.7	
(number)	(1570)	(1479)	.94	(228)	(271)	1.19
60-80	59.9	64.1		70.7	74.0	
(number)	(1707)	(1259)	.74	(616)	(623)	1.01
80 and over	63.9	69.8		74.5	77.4	
(number)	(787)	(470)	.60	(1072)	(662)	.62
Grade 12 Scholastic Aptitude Score						
Less than 40	64.1	66.2		69.2	70.1	
(number)	(431)	(588)	1.36)	(142)	(204)	1.44
40-60	67.9	67.8		70.4	72.7	
(number)	(495)	(484)	.98	(381)	(422)	1.11
60-80	66.6	70.1		72.1	78.1	
(number)	(428)	(348)	.81	(649)	(561)	.86
80 and over	68.7	74.0		75.6	79.9	
(number)	(164)	(122)	.74	(716)	(341)	.48

things out ("that's just the way things are, don't ask why?") but encouraged to follow orders and be docile and cooperative rather than competitive?

With respect to the difference in Grade 9 marks between those who subsequently will or won't get Grade 13 diplomas, the explanation is, I believe, simpler. In Grade 9, students have already mostly been sorted into five-year academic or into other programs. Teachers just "naturally" give higher marks to students in the five-year stream. They probably assume that the sorting prior to Grade 9 has been well done. And, if the streams are kept relatively separate, a given teacher may teach in only one program and so have no real basis for comparing students in one stream with those in another. Further, a student who did display high scholastic aptitude in Grade 9 but who finds him/herself in a non-academic program, surrounded mostly by youngsters without the same ability, may appear (and become?) dull or uncooperative.

An important consequence of the much higher average marks given to students in the five-year stream is that other students are thereby discouraged from switching into the five-year academic stream. It is, however, a conundrum why the differences in average marks (for the same aptitude) displayed in the table have not narrowed with the passage of time.

The reader will wonder why the data of Table 5.2 were not broken down by school and by father's occupation. The answer is that they were but no pattern was thereby revealed, i.e., after controlling for sex, scholastic aptitude score and school,father's occupation did not appear to affect average marks and, after controlling for sex, aptitude and father's occupation, school did not appear to affect marks -- except in the case of Catholic schools which awarded somewhat higher marks pretty much across the board. This is important because it indicates

that the differences in diploma rates by occupation of father or school do not appear to be explained by differences in marks, except perhaps in the case of females. Rather, marks reflect the results of a training and sorting process which is nearly completed by Grade 9. Youngsters from more affluent families and neighbourhoods perform better in school and this is recognized in the higher percentage of such youngsters who perform well on scholastic aptitude tests and who are found in five-year academic programs. In secondary school, as in elementary school, what may be thought of as the rank order of students on entrance does not seem to be much changed as a result of schooling. Of course, with reference to marks, matters could be different: teachers might, for students with the same aptitude and in the same school and program, give higher marks to children from more affluent families. This teachers do not appear to do.

Consider next what happens to marks during the course of secondary school. As Table 5.3 shows, average marks drop regularly, year by year. In effect, teachers act as if they were aiming toward the marks they guess their students will receive on the province-wide, Grade 13 examinations (except in the case of "Toronto-poor" but only 40 students were in Grade 13 from these schools). This practice of reducing average marks over the secondary school years should be contrasted with what goes on in university where average marks regularly increase over the three or four years students spend there. I imagine that the displayed secondary school practice may serve, in part, to discourage some students from continuing in school and one wonders what would have been the consequence of setting a higher distribution for marks on the provincial Grade 13 examinations. As we will see, this is partly what happened when these examinations were dropped. Notice also that,

Table 5.3

Average Marks in Each Grade by School and Program,

Metro Toronto, 1959-64

	Toronto			Other Metro				
	Rich	Middle	Poor	Rich	Middle	Poor	Catholic	Private
Stopped Before Grade 12								
Grade 9	64	57	58	55	58	57	58	63
10	63	58	59	57	58	58	56	59
11	62	57	56	55	58	57	56	54
Number with recorded marks in Grade 9	375	1348	1594	607	1231	2825	742	110
Number with recorded marks in Grade 11	190	343	247	181	330	817	158	50
Stopped With Grade 12								
Grade 9	68	65	68	66	65	66	68	69
10	63	64	66	64	65	66	65	64
11	62	62	66	62	63	64	62	63
12	58	58	63	58	60	61	56	64
Number with recorded marks in Grade 9	102	362	406	253	375	707	231	44
Number with recorded marks in Grade 12	94	347	556	248	376	925	271	61
Received Grade 13 Diploma								
Grade 9	75	73	75	74	74	74	80	75
10	73	73	75	74	74	74	76	74
11	70	71	74	71	72	71	73	71
12	70	69	74	69	70	70	71	72
13*	70	68	64	68	70	68	67	71
Number with recorded marks in Grade 9	339	561	36	417	586	721	249	149
Number with recorded marks in Grade 13	363	577	42	425	606	876	351	205

*The Grade 13 mark is the province-wide examination work

N.B. Students are located by their Grade 9 school whether or not they subsequently switched schools.

in the case of students who dropped out of school before Grade 12, very large numbers dropped before Grade 11.

Turning to those students who both reached Grade 13 and got diplomas, Table 5.4 reports average marks on the provincial examinations by scholastic aptitude scores received in Grade 12 and by sex. Detail by school and father's occupation has been suppressed since no pattern was apparent for these variables. The results parallel closely those reported in Table 5.2.

In summary, secondary schools in the Carnegie period acted "as if" their tasks were (1) discourage the great majority of students from getting a Grade 13 diploma, (2) reaffirm the streaming decisions made by senior public schools, (3) prevent the sex ratio of Grade 13 graduates from diverging too far from 1.00.

Table 5.4

Average Score on Grade 13 Provincial Exam by Scholastic Aptitude and Sex, Metro Toronto 1963

Grade 12 Scholastic Aptitude Score	Male	Female	Sex Ratio (f/m)
Less than 40	54.3	57.1	
(number)	(232)	(333)	1.44
40-60	58.6	63.1	
(number)	(534)	(552)	1.03
60-80	62.6	67.4	
(number)	(795)	(695)	.87
80 and over	70.3	72.7	
(number)	(826)	(407)	.49
All	63.6	65.6	
	(2387)	(1987)	.83

CHAPTER SIX

SCHOOLS 1963 AND 1972

Analysis of the Carnegie data provides sketchy knowledge of how schools treated students in the early 1960's who came with various characteristics. Are schools in the 1970's behaving in the same or in a markedly different way towards students? Although data with which to form a judgement are incomplete, I believe that some comparisons may be made. Start with the "net retention" rates taken from Provincial lists and reported in Appendix Table 6.1.[23] For each group of schools in Toronto, a higher percentage of youngsters reached Grade 13 in the more recent period but the overall percentage (putting Toronto and the other boroughs together) remained constant. The reason is clear: the percentage of students found in "Toronto-poor" schools increased. This shift in enrolment pattern is presumably a consequence of the large flow of immigrants to Toronto during the 1960's. Controlling for father's occupation, children who do not speak English at home display higher retention rates but a relatively large percentage of immigrant families are in low-status occupations and live in poorer neighbourhoods. (The growth of community colleges which require a Grade 12 rather than a Grade 13 diploma for entrance could also be part of an explanation, although a minor part.)

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23 "Net retention rate" is simply the number of students enrolled in one grade divided by the number enrolled one year earlier in the preceding grade. Therefore, it may be misleading, e.g., a Grade 10 student in a given school could have come from Grade 9 in the same school, from Grade 9 in a different school, skipped into Grade 10 directly from Grade 8, repeated Grade 10 in the same or a different school. For the Carnegie period a less ambiguous estimate of retention was reported in Table 4.1 above; for 1973-74, in the City of Toronto estimated retention rates were 86, 68, 57, 42 for Grade 9 into Grade 10, into Grade 11, etc. (Young and Reich, 1974). For the City of Toronto public schools (but not for other boroughs), information on father's occupation and language spoken at home are available both for 1959 and 1970 and this is used to divide Toronto public schools into three groups. (See Text Table 3.2 and Appendix Table 4.1.)

The two major changes that took place over the period covered by the data of Appendix Table 6.1 are (1) a massive increase of population in Scarborough, North York and Etobicoke and (2) an increase in the percentage of Grade 13 pupils who obtained their honours diplomas and, more strikingly, in the percentage who were designated Ontario Scholars. During the first and second periods shown in the table, marks received on province-wide examinations were used to decide who should receive a diploma and an Ontario Scholarship; in the most recent period, each school made its own decisions -- albeit with due attention to precedent.

So as to understand this change better, Table 6.1 has been prepared (see also Appendix Table 1). In it, 1963 and 1967 diploma and Ontario Scholar rates have been applied to the number of 1972 Grade 13 enrolments and diplomas respectively. The bulk of the increase in diploma rates took place while there were still province-wide examinations; in contrast, most of the increase in the Ontario Scholar rate took place after the province-wide examinations were dropped and the most substantial increases in Ontario Scholarships appear to have occurred in middle class and affluent neighbourhoods. It seems doubtful if a fifth of all Grade 9 children in "Toronto-rich" schools (using net retention rates) deserved the title "Ontario Scholar" when the comparable percentage for "Toronto-poor" schools was only one per cent. Yet those are the figures for 1971-72. In 1959-63 the parallel percentages were 8 and nearly zero respectively.

Table 6.1

Inferred and Actual Number of Grade 13 Diploma Recipients and Ontario Scholars, by School Group, Metro Toronto, 1972

School	Diplomas				Ontario Scholars			
	At 1963 Rate	At 1967 Rate	1972 Actual	Difference 1963-1972	At 1963 Rate	At 1967 Rate	1972 Actual	Difference 1963-1972
Toronto (public)								
Rich	500	564	588	88	70	85	151	81
	(85)	(96)			(46)	(56)		
Middle	1176	1509	1444	268	82	157	258	176
	(81)	(104)			(32)	(61)		
Poor	147	192	255	108	5	8	30	25
	(58)	(75)			(17)	(27)		
All Toronto	1823	2265	2287	464	157	250	439	282
	(80)	(99)			(36)	(57)		
East York	292	412	295	3	34	25	68	34
	(99)	(140)			(50)	(37)		
Etobicoke	1362	1705	1667	305	167	143	275	108
	(82)	(102)			(61)	(52)		
North York	2070	2403	3060	990	333	444	550	217
	(68)	(79)			(61)	(81)		
Scarborough	968	1700	1832	864	90	176	328	238
	(53)	(93)			(27)	(54)		
York	357	502	463	106	32	56	75	43
	(77)	(108)			(43)	(75)		
All public	6872	8987	9604	2732	813	1094	1735	922
	(72)	(94)			(47)	(63)		
Catholic	819	828	995	176	140	107	193	53
	(82)	(83)			(73)	(55)		
Private	401	472	538	137	70	95	168	98
	(74)	(88)			(42)	(57)		
All Metro Schools	8092	10287	11137	3045	1023	1296	2096	1073
	(73)	(92)			(49)	(62)		

N.B. Index numbers in parentheses (1972 actual = base).

Another comparison of schools between 1963 and 1972 may be made on the basis of Grade 13 marks and scores received on scholastic aptitude tests.[24] Such a comparison is, however, necessarily vague since a given mark in these two years may not indicate the same things. The scholastic aptitude tests scores have similar defects: in the Carnegie period, SATO tests were given in Grade 12 while, for 1972, SACU tests were administered in Grade 13. These two sets of tests are not obviously comparable (see Appendix Table 6.2) and I have been unable to discover any group of students who took both sets of tests. Nonetheless, in Tables 6.2 and 6.3 are reported the results of a comparison for students in City of Toronto schools. To make the two groups of students roughly comparable, only students who received their Grade 13 diploma in their fifth year of secondary school were counted in 1963 while only students who received their diploma and were either 18 or 19 years of age were counted in 1972.

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24 The comparisons reported below are, for Carnegie students, based on all students in Grade 13, regardless of where in Ontario they were enrolled in earlier grades.

Table 6.2

Grade 13 Average for Male and Female Students by Scholastic Aptitude, City of Toronto Public Schools

SATO/SACU	1963 Grade 13 average		Sex ratio (f/m)	1972 Grade 13 average		Sex ratio (f/m)
	male	female		male	female	
Bottom quartile	63.4	64.1	1.55	63.4	65.0	1.34
(number)	(100)	(155)		(109)	(146)	
2nd quartile	65.0	68.1	.87	66.1	67.6	.96
(number)	(120)	(105)		(132)	(127)	
3rd quartile	68.4	69.3	.87	68.3	71.1	1.00
(number)	(116)	(101)		(128)	(128)	
Top quartile	72.3	74.1	.63	72.1	75.9	.71
(number)	(137)	(86)		(151)	(107)	
All (both sexes)	67.8			68.6		
(number)	(966)			(1028)		

Table 6.3

Average Scholastic Aptitude Scores by Grade 13 Average and Sex, City of Toronto public schools

Grade 13 average	1963 (SATO)				1972 (SACU)			
	male		female		male		female	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
less than 60.0	61	23	54	11	56	37	51	20
(percentage)	(16)		(18)		(19)		(13)	
60.0 - 68.9	67	37	62	25	59	48	57	39
(percentage)	(37)		(32)		(38)		(36)	
69.0 - 79.9	74	58	70	46	64	65	60	50
(percentage)	(41)		(42)		(31)		(36)	
80 and over	86	91	71	52	69	80	69	79
(percentage)	(6)		(8)		(12)		(15)	
All (both sexes)	67		40		56		35	
(percentage)	(100)		(100)		(100)		(100)	

Note: (1) raw scores as percentage of maximum score;
(2) percentile rank scores with reference groups being all City of Toronto public school students who took test in designated year.

What conclusions flow from the data found in these tables? First, average marks changed only slightly (67.8 versus 68.6), although the percentage of students receiving marks of 80 or more doubled. Second, girls appear to have benefitted more from the withdrawal of the province-wide examinations than have boys. Perhaps teachers are less demanding of female students. Third, student who, under the older examination system, would have scored just below 80 appear to have been pushed just above 80 under the newer grading system. Fourth, regarding the important question whether a mark of, say, 70 meant the same in 1972 as it did in 1963, there is no clear answer.

One way around the absence of linkage between student performance in the two years, is to find in 1963 and in 1972 groups of students who were essentially the same. There are six schools in the City of Toronto whose students were nearly the same in terms of the distribution of father's occupations and in terms of the percentage of these students whose families spoke English at home. In Table 6.4 is found a comparison of Grade 13 marks and scholastic aptitude scores for students in these six schools with all students in City of Toronto public schools. (See also Appendix Table 6.3.) The ratios indicate that the two years were not much different, i.e., students in other schools did only slightly better in 1972 in terms of marks than did the reference group but these other students held their own in terms of scholastic aptitude scores. Notice that the average mark of students in the six schools fell slightly between 1963 and 1972.

More illuminating are the data reported in Table 6.5. For the six schools and for all schools, while the percentage of youngsters who received marks of 80 or more increased between 1963 and 1972, the percentage receiving marks between 69 and 80 fell.

Table 6.4

Comparison of "Six Schools" With All City of Toronto Public Schools

SATO/SACU	1963 Grade 13 average (all schools) / Grade 13 average (six schools) male	1963 female	1972 Grade 13 average (all schools) / Grade 13 average (six schools) male	1972 female	Grade 13 average	1963 SATO all schools / SATO six schools male	1963 female	1972 SACU all schools / SACU six schools male	1972 female
Lowest quartile	1.01	.99	1.02	1.03	less than 60	.92	.95	.99	1.00
2nd quartile	.99	1.00	1.01	1.02	60 - 68.9	1.01	1.01	.99	.98
3rd quartile	1.01	1.00	1.00	1.03	70 - 79.9	1.00	.98	.98	.97
Top quartile	.99	.99	1.01	1.00	80 and over	1.01	.93	.98	.96
All (both sexes)	$\frac{67.80}{68.35}$ =.99		$\frac{68.64}{68.08}$ =1.01			$\frac{20.14}{20.58}$ =.98		$\frac{482.29}{489.75}$ =.98	
Coefficients of variation	$\frac{11.5}{11.7}$ =.98		$\frac{13.0}{12.7}$ =1.02			$\frac{28.5}{25.9}$ =1.10		$\frac{17.12}{16/98}$ =1.01	

N.B. The six schools are: Forest Hill, Jarvis, Malvern, North Toronto, Northern Secondary, Riverdale.

Table 6.5

Crosstabulation of Grade 13 Average Against Scholastic Aptitude for Six City of Toronto Public Schools

SATO/SACU	Grade 13 average									
	less than 60		60-69		69-80		80 and over		All	
	six	all	six	all	six	all	six	all	six	all
bottom quartile										
1963	7.4	8.3	11.2	11.7	6.8	7.0	0.8	0.4	26.2	27.4
1972	7.4	7.4	9.3	10.1	4.4	6.3	-	0.8	21.1	24.6
2nd quartile										
1963	3.7	4.7	8.7	9.4	9.9	9.5	0.6	0.6	22.9	24.2
1972	4.4	4.1	11.8	12.4	7.2	7.8	1.2	1.5	24.5	25.9
3rd quartile										
1963	2.7	2.2	7.8	8.1	13.0	12.2	0.8	0.9	24.2	23.3
1972	3.0	2.2	10.6	9.2	11.8	9.8	2.3	3.4	27.8	24.7
Top quartile										
1963	1.2	1.3	4.3	6.1	15.5	13.0	5.8	4.6	26.7	25.1
1972	1.4	1.9	6.9	5.8	10.9	9.6	7.4	7.5	26.6	24.8
All										
1963	14.9	16.9	32.0	35.3	45.2	41.1	7.9	6.7	100.0	100.0
1972	16.2	16.0	38.6	38.3	34.3	32.7	10.9	13.0	100.0	100.0

N.B. number of students in six schools: 516 in 1963; 432 in 1972;
number of students in all schools: 976 in 1963; 1189 in 1972.

However, the assumption that students in the six reference schools were essentially identical in the two years could easily be false, i.e., all students (including those in the six schools) could have been better prepared academically in 1963 than they were in 1972 -- or worse prepared.[25]

Rather than tease this essentially intractable problem further, I conclude this section with a comparison of Toronto public schools in rich, middle and poor neighbourhoods in the two years (see Appendix Table 6.4). As expected, the changes within each group of schools are much greater than the overall change; the distribution of students across neighbourhoods was markedly different in 1972 than it was in 1963. One suspects that teachers had greater difficulties making distinctions among students found in poorer neighbourhoods.[26]

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25 There was, over the whole period, a noticeable change in the subjects taken by Grade 13 pupils. On a province-wide basis, language study declined dramatically while the proportion of students taking geography, history and an array of non-traditional subjects, e.g., art, home economics, rose.

26 I had hoped to use the scores received by Ontario students in the (U.S.) College Board examinations as a bridge between 1967 and 1972 but the requisite data are no longer available. For recent CEEB data, however, see Tables B.8 in the Appendix to Chapter 8.

CHAPTER SEVEN

SCHOOLS AND NEIGHBOURHOODS

In this chapter, the interactions between neighbourhood influences and schools will be considered. For a definition of neighbourhoods and a discussion of student data, see the Appendix to this chapter where the 4012 Census enumeration areas (EA's) found in Metro Toronto are sorted first by elementary public school district and second by the ethnic-income code given in Tables A.5 and A.8 of this Appendix. Summary data by neighbourhoods for students attending Grades 12 and 13 and for all persons 18-19 years are found in Appendix Table 3, and Appendix Tables 1 and 2 give useful parallel data for schools which offer Grade 13 subjects. These data provide the empirical base for this chapter; they are given in some detail for reference and so that a reader may perform his/her own analysis.

Grade 13 Attendance and Characteristics of EA's

For each EA in Metro Toronto, the number of students reported to be attending Grade 13 and the number of persons aged 18 or 19 were both counted. The ratio of these two numbers may be viewed as "produced" by the several characteristics used in defining neighbourhoods, i.e., as the final outcome of the screening process by which some students are declared not eligible for university, at least not until they are over 21 years of age.

Table 7.1 presents a summary picture with the attendance ratio related to average family income and home ownership. To construct this table, some adjustments of the raw census data were required, namely the removal of enumeration areas for which (1) average family

Table 7.1

Ratio of Grade 13 Enrolments to All Persons Aged 18 or 19 and Grade 13 Attendance for Metropolitan Toronto by Average Family Income and Home Ownership for Neighbourhoods, 1971

Average family income (in thousands of dollars)	Ratio		Attendance			
	50% or more home ownership	less than 50% home ownership	50% or more home ownership		less than 50% home ownership	
			number	%	number	%
less than 8	36	20	125	(1)	1835	(10)
8 - 10	29	22	1225	(7)	2535	(14)
10 - 12	33	27	2665	(14)	1565	(8)
12 - 15	36	32	3345	(18)	850	(5)
15 - 18	49	41	1425	(8)	265	(1)
18 and over	57	43	2665	(14)	270	(1)
All	30		18770 (100)			

income was reported as zero, (2) number of persons aged 18 or 19 was reported to be zero, and (3) which contained boarding schools. These adjustments resulted in the removal of 332 EA's and 1580 Grade 13 enrolments or about 8 per cent of all EA's and Grade 13 enrolments.[27] In some instances, the Census reported average family income, the number of persons aged 18 or 19, or Grade 13 enrolment to be zero when it was not in order to preserve confidentiality and because Statistics Canada rounded off numbers.[28]

The removal of these defective EA's does introduce additional bias, e.g., areas in which rich families live will be somewhat underreported, especially if these rich families have enrolled their children in boarding schools or sent them to university outside Ontario after Grade 12. Notice also that the ratios found in Table 7.1 will all be too large because the numerator contains all persons enrolled in Grade 13, regardless of age, while the denominator contains only persons aged 18 or 19. Nonetheless, the size of the ratio should be strongly related to the size of the "true" ratio, although there are "anomalies" as Appendix Table 3 indicates.

Table 7.1 indicates that families living in richer areas and in areas where home ownership is high are more likely to have children in Grade 13, a finding that is scarcely surprising. There is, however, a problem of interpretation: does high home ownership indicate a more stable neighbourhood in which children are especially prized or does it just indicate a wealthier neighbourhood? Or

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27 The locations of these removed students are given in Appendix Table 3. As indicated in the Appendix, richer neighbourhoods are undercounted.

28 There is evidence that the Census method of rounding is incorrect (see Appendix Tables A.2 and 3)

is income underreported by exclusion of, for example, the imputed rent of owner-occupied dwelling units? I believe this latter explanation is more likely correct and am encouraged in this belief by the absurd correlation coefficients reported in the Appendix and by data reported in earlier chapters. Beyond this, remember that the data reported are for Grade 13 enrolments; perhaps only 70 per cent of these students will actually obtain Grade 13 diplomas and thereby become eligible for BIU support in an Ontario university.[29]

In order to make sure that the relationship reported in Table 7.1 is meaningful, one should control for other possible influences. With available data, it is possible (to some extent) to control for ethnic identification and religious preference. Table 7.2 reports the percentage of youngsters in Grade 13 by both average family income and ethnic identification. As some readers will expect, "Jewish" neighbourhoods show the highest percentages, followed by "British Isles 50-75%" and a mixture of "British Isles and East European". And this same order is preserved if one looks only at data for neighbourhoods with low or with high reported average family incomes.

But there are problems with these "facts". If neighbourhoods that are mostly Jewish or British Isles 50-75% send high percentages of youngsters to Grade 13, why do neighbourhoods that are mixed British Isles and Jewish send low percentages? Why do neighbourhoods that are 75 per cent or more British Isles and poor send a substantially smaller percentage of youngsters to Grade 13 than do neighbourhoods that are 50-75 per cent British Isles and poor? And why does the

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29 BIU is the acronym for "basic income unit" used by the Ontario Government to determine how much money will be paid to each university.

Table 7.2

Ratio of Grade 13 Enrolments to All Persons Aged 18 or 19 by Average Family Income and Ethnic Identification, Metropolitan Toronto, 1971

Ethnic Identification	Average Family Income (in thousands of dollars)														
	less than 8		8-10		10-12		12-15		15-18		18 and over		Average all incomes	Incomes less than 12	Incomes 12 or more
	ratio	rank	ratio	rank	ratio	rank	ratio	rank	ratio	rank	ratio	rank			
British Isles 75% or more	8	5	16	7	26	5	37	2	49	2	51	3	4.0	5.7	2.3
British Isles 50-75%	22	1	26	3	31	4	34	3	45	3	53	2	2.7	2.7	2.7
Italian 50% or more	21	2	19	5	23	7	32	4	-		-		4.5	4.7	4.0
Jewish 50% or more	-		28	3	32	3	48	1	61	1	72	1	1.6	2.5	1.0
British Isles 25-50% and Italian 25-50%	-		14	8	46	1	16	7	-		42	4	5.0	4.5	5.5
Jewish 25-50%	18	4	21	4	24	6	34	3	-		-		4.2	4.7	3.0
"East Europe" 25-50%	-		31	1	44	2	28	5	-		-		2.7	1.5	5.0
"Other" 25-50%	20	3	31	1	31	4	24	6	41	4	-		3.6	2.7	5.0
None of above	22	1	18	6	44	2	28	5	-		-		3.5	3.0	5.0
All	20		24		30		24		47		54				

N.B. cells containing five or fewer EA's have been omitted

rank order of neighbourhoods which are British Isles mixed with either East European or "other" change so markedly as family income rises?

While the data available do not permit full answers to these questions, one can compute the percentage enrolled in Grade 13 as related to average family income, controlling not only for ethnic identification but also for home ownership and, to a limited extent, for religious preference as well. Appendix Tables 7.1 report results. In sum, it is difficult to discover any systematic ethnic or religious influence. Although the important question why "Jewish" neighbourhoods are richer while, e.g., "None of above" or "Italian" neighbourhoods are poorer, remains unanswered.

Grade 13 Attendance, Diplomas and School District

I start with Census data to see if neighbourhood makes a difference in the percentage of youngsters enrolled in Grade 13. To this end, EA's were assembled by elementary public school districts which were, in turn, sorted into five groups according to the ratio of Grade 13 enrolment to all persons aged 18 or 19. Then each such group of EA's was further subdivided by average family income and home ownership. School district was used so that people living near one another would be combined, not because the elementary public school is viewed as important. It may be, but not all youngsters attending Grade 13 from a given school district attended the same public elementary school nor do I assume that they did. The results are reported in Table 7.3. Propinquity does seem to affect Grade 13 attendance, i.e., children from a poor (rich) area are more (less) likely to enrol in Grade 13 if this is a common (uncommon) practice in their school district (Henderson, et al, 1976).

Table 7.3

Ratio of Grade 13 Enrolment to All Persons Aged 18 or 19 by School District, Average Family Income and Home Ownership, Metropolitan Toronto, 1971

School district (percent in Grade 13)	Average family income (in thousands of dollars)						All enumeration areas	
	less than 8	8-10	10-12	12-15	15-18	18 or more	number	%
less than 15							408	11
less than 50% home owners	8	8	7	9	4		196	5
50% or more home owners	25	20	21	22				
15-25							540	14
less than 50% home owners	16	14	13	12		15	290	8
50% or more home owners	25	13	23	26	29			
25-35							591	16
less than 50% home owners	21	24	29	38	28	28	372	10
50% or more home owners	40	34	30	21	26	52		
35-50							466	12
less than 50% home owners	66	33	30	33	42	38	451	12
50% or more home owners		36	44	41	48	51		
50 or more							173	5
less than 50% home owners	39	40	50	58	104 *	56	264	7
50% or more home owners	-	75	62	59	72	74		
							3751	100

N.B. Cells containing 5 or fewer EA's have been omitted.

* This is not an arithmetic error but could be the result of a census counting error of which there appear to be several. See Appendix Table 3.

In only 6 out of 40 possibly adjacent pairs is this relationship reversed. Indeed, from Table 7.3 this "peer influence" is slightly more important than is family income (17 reversals out of 43 possible adjacent pairs). Table 7.2 gives data on actual enrolments for the cells defined in Table 7.3.

With the data available from the Ministry of Education on Honours diploma recipients, a check of these results may be made. First, each diploma recipient was located in his/her census enumeration of residence and thereby tagged with an ethnic-income code and also with a public elementary school district code. To summarize the data obtained from this coding operation, look at Table 7.4 in which the 400 elementary school districts have been grouped according to the income characteristics of the particular EA's within them whence came youngsters who attend Grade 12 (as reported in the 1971 Census). The income classes used may seem odd but, as the data in Appendix Table 8 indicate, so is the income distribution over these school districts.

The data are less dramatic than those of Table 7.3 where Grade 13 attenders rather than diploma recipients were used. This is not surprising since fewer categories are used.

There is a problem of inferring causation from these data. School districts from which most youngsters attend Grade 13 are also districts in which most families are relatively affluent, and conversely, i.e., cells along the northwest-southeast diagonal are much fuller than those in the opposite direction. There is also a question of what one does with the information that youngsters from poorer families would stay longer in school if their parents lived in a school district from which most youngsters continued into Grade 13.

Table 7.4

Grade 13 Diploma Recipients and Persons Aged 18-19 Years by School District, Metro Toronto, 1971-72

School district income class	Number of school districts	Number of diplomas	Number aged 18-19 years	Diploma rate
1) 90% or more under $10,000 *	72	1132	15630	7
2) 30-90% under $10,000 and none 50% or more $15,000 or more	90	2134	19760	11
3) Less than 30% under $10,000 and none 90% or more between $10,000 and $15,000 and none 50% or more over $15,000	80	2107	12730	17
4) 90% or more between $10,000 and $15,000	91	1941	11605	17
5) 50% or more ≠ $15,000 or more	65	2643	9995	23
Totals	398	9957	69720	15

N.B. Four school districts were omitted because the data seemed anomalous (see footnote to Appendix Table 3).

* Of these districts, 59 had 100% of students from EA's with average family income less than $10,000.

≠ Of these districts, 23 had 90% or more of students from EA's with average family income of $15,000 or more.

If less affluent families came to dominate in these areas, might not the principal effect be to increase the percentage who dropped out before Grade 13?[30] It cannot be family income and wealth that are really important; rather it will be parental attitudes toward academic subjects. With the limited data from the Census, nothing much can be said about that.[30a] To complete the survey of Census data, several additional tables are presented in the appendix (see Appendix Tables 7.3 through 7.5).

Several clues regarding the screening process which is accomplished through schooling do come from these Census data. But clues are all they are since the data are for groups of families who live near one another or in similar neighbourhoods. There is no way of discovering for sure whether the families with youngsters in Grade 13 are like the "average" family in the neighbourhood or not. From previous data, one suspects that this special group of families will be somewhat richer and better educated.

School and Neighbourhood Characteristics

The interrelationship between schools and neighbourhoods may be examined directly to a limited extent rather than indirectly as was done in the last section. To this end, I have categorized schools, on the one hand, according to the reported average family incomes of the neighbourhoods whence come their Grade 13 diploma recipients and, on the other hand, according to the Spearman rank order correlation within each school of SACU scores against Grade 13

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30 On the basis of U.S. data, Professor James Coleman once suggested that the limit to such mixing of poor with affluent youngsters might be one-third. Since there are many more poor than rich families, Coleman's hunch is only marginally useful for policy.

30a This matter will be considered later where drop-out rates for various groups of students and schools will be reported.

average marks. In Appendix Table 7.6 are reported the results of sorting schools in these two ways:[31] Very few youngsters from poor neighbourhoods are found in schools where the Spearman correlation is high while, in contrast, a high percentage of youngsters from rich neighbourhoods do attend schools where the Spearman correlation coefficient is high (see also Appendix Table 2). There are also interesting differences among the several boroughs and between public and private schools; relatively few Scarborough or City of Toronto public schools show a high correlation between Grade 13 average marks and SACU scores while the reverse is true of private schools.

From the background of the past few chapters, these results are not surprising. In schools serving poor neighbourhoods and using Carnegie data, one is hard pressed to discover a set of variables which explain differences in marks among students or, for that matter, differences in performance between one grade and the next for the same student. In private schools serving rich neighbourhoods, matters are otherwise: scholastic aptitude in positively related to marks and (from Carnegie data) has been so related since Grade 9; furthermore there is a high positive correlation between the marks given in one year and the marks given in the next.[32] Perhaps memorization (as opposed to analytic skill) is a more important determinant of marks in poor neighbourhood schools than in rich neighbourhood schools but I have no data with which to test this hypothesis.

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31 In this and subsequent tables, remember that North York is undercounted and is richer than average.

32 From Carnegie data the correlation coefficient between Grade 9 and Grade 13 average marks for private schools was .50; for public school in poor neighbourhoods in the City of Toronto, this coefficient was .09.

At first, I supposed that character traits such as "reliability", "cooperation" or "industry" would be more important in poor neighbourhood schools but the correlation coefficients between such variables and either average marks or scholastic aptitude test scores are about the same in these schools as they are in private schools or in public schools serving rich neighbourhoods. Perhaps teachers who find their way into schools that display low correlations between average marks and SACU scores are different in noticeable ways from teachers who gravitate towards schools displaying high coefficients. Perhaps the later are oriented more towards subject matter. Data with which to test such hypotheses may exist but I was denied permission to find out by the Ministry of Education.[33] The withdrawal rate of teachers in public schools is, of course, negatively related to the average family income of the neighbourhoods served by the school. And it may be fair to assume that these richer neighbourhoods collect and keep the better teachers but again I have no hard evidence with which to test this guess. To know that relevant data do exist in the Ministry of Education and Statistics Canada without being able to use them is frustrating, especially since public monies are involved.

The question remains what difference does a weak correlation between Grade 13 marks and SACU scores make? From the data, any effect on the percentage of Grade 12 or of Grade 13 students who get Honours Diplomas is negligible, although the effect on individual students

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33 From U.S. studies, using improvement in scores on subject matter tests as a criterion, neither experience nor credentials possessed by teachers seems to make much difference; scores of teachers themselves on verbal and other aptitude tests does. (Brown, 1972; Perl, 1973; Brown and Saks, 1975)

(who may come to believe that luck is more important than scholastic ability or hard work) may be pronounced. The income characteristics of neighbourhoods from which students come, not the correlation coefficients are more important in explaining variations in the percentage of students who receive Honours Diplomas or are awarded Ontario Scholarschips. Table 7.5 provides detail.

To demonstrate how difficult it may be to discover what the schools (or teachers) are doing, consider those characteristics of schools which might reduce the teacher withdrawal rate. Would teachers prefer a school that awarded a high percentage of students with Ontario Scholarships? A school which contained many youngsters with high scholastic aptitude scores? Would teachers like a school that displayed a high (positive) correlation between marks and scholastic aptitude? How about one that put a high percentage of the Grade 12 class into Grade 13? In all these cases I would have guessed "yes". In terms of schools grouped according to the cells of Table 7.5, I would have been wrong 61 per cent of the time. Take another example. What sorts of schools would Grade 13 parents (and students) prefer? Those with high diploma and Ontario Scholarship rates? Those that give high marks? If "yes", as I expected, then the retention rate between Grades 12 and 13 should be high in such schools, and conversely. The answer is, again using the cells in Table 7.5, "no" in 31 per cent of the cases.[34]

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34 Using Pearson (zero order) correlation coefficients. And the coefficients values range from +.999 to -.999 (both significant), in the teachers example, and from +.846 to -.846 in the parent/student example (again both significant).

Table 7.5

Percentage of Grade 13 Diploma Recipients Who Received Ontario Scholarships by Neighbourhood Income and SACU Score for 1972 and Change in Ontario Scholarship Rate Between 1967 and 1972, Metro Toronto

Average SACU score		Per cent average family income greater than $14,999			
		1% or less	1-21%	21-45%	over 45%
499 or less	(a)	15.6	17.3	33.2	23.0
	(b)	10.3	8.6	22.6	14.0
500-521	(a)	12.7	15.8	21.5	20.2
	(b)	5.6	7.0	7.0	12.5
522 and over	(a)	13.8	21.1	28.1	25.5
	(b)	3.8	11.1	5.7	6.1

N.B. (a) is the unweighted Ontario Scholarship rate.
(b) is the change in the Ontario Scholarship rate measured in percentage points.

Given the low correlations between Grade 13 average marks and SACU scores in schools attended by many students, one is not surprised to find that SACU scores are not closely related to the Ontario Scholarship rate. Since scholastic aptitude tests are biased in favour of youngsters who come from middle class and rich families, this may not be a bad thing. However, the screening or filtering out of youngsters from poor neighbourhoods has, in bulk, already taken place before Grade 13. In consequence, one should find a higher percentage of students who score high on SACU in those schools found in rich neighbourhoods. To test this hypothesis, I have computed (under the assumption that SACU scores are normally distributed) the percentage of students who score better than the average SACU score of students attending Grade 13 in the prestigious University of Toronto School for each of the cells shown in Table 7.5. The results are found in Table 7.6. The results are expected: the cell in the southeast corner is largest. Parents of academically talented children (if they can afford it) find schools in which there is a high correlation between scholastic aptitude and the marks assigned by teachers.

If "smart" youngsters are distributed randomly over all families, one can use the percentage obtained from the last column of Table 7.6 (11%) and apply it to all Grade 9 pupils. Roughly speaking, it thus appears that about half of Metro Toronto's academically talented youngsters do not reach Grade 13. This result is approximately what was found in the Carnegie data.

Table 7.6

Percentage of High Scholastic Aptitude Students

in Metropolitan Toronto Schools, 1971

Grade 13 average -SACU rank order correlation coefficient	Per cent average neighbourhood income greater than $15.000			
	1% or less	1-21%	21-45%	over 45%
less than .45	4	3	4	9
.45 - .55	4	4	5	9
more than .55	4	4	7	14

Next, look at Table 7.7_a in which, using these same income and correlation coefficient classes, there are reported three ratios: (a) number of honours diplomas (taken from the CRØS file) divided by number of persons aged 18 or 19 (taken from the 1971 Census); (b) the Grade 13 attendance rate; (c) Grade 13 attendance divided by Grade 12 attendance (both for the same year and taken from the Census). Whichever column one uses, the rates increase with wealth (except the last where there is one inversion). Looking at rows (and neglecting the last column), there are too many inversions for any consequential statement, although most do occur in the group of school districts served by schools with a high correlation between SACU scores and Grade 13 average marks. Table 7.7b gives the location by school district code of high scholastic aptitude youngsters; in it earlier findings are confirmed. If school districts are ignored, a very similar picture is obtained (see Appendix Table 7.7).

Table 7.7a

Unweighted Diploma Rates, Grade 13 Rates And Retention Rates by Income And Rank Order Correlation Coefficient Between SACU And Grade 13 Average Mark For Principal Schools Serving Districts, Metro Toronto, 1971-72

(Percentages)

School district income class		One or a few schools serve each district: Less than .45	.45-.55	More than .55	Several schools serve each district
	a) Diploma rate	6	7	9	7
1) 90% or under	b) Grade 13 rate	16	20	16	19
under $10,000	c) Grade 13 retention	6	7	4	65
		(178)	(460)	(105)	(389)
2) 30-90% under $10,000 and	a) Diploma rate	10	11	16	9
none 50% or more	b) Grade 13 rate	21	26	45	29
$15,000 or more	c) Grade 13 retention	54	61	57	76
		(549)	(1115)	(296)	(174)
3) Less than 30% under $10,000	a) Diploma rate	18	17	18	16
and none 90% or	b) Grade 13 rate	30	30	30	27
more between $10,000	c) Grade 13 retention	59	63	60	70
and $15,000 and none 50% or more over $15,000		(489)	(841)	(655)	(122)
4) 90% or more	a) Diploma rate	15	18	21	10
between $10,000 and	b) Grade 13 rate	29	31	22	43
$15,000	c) Grade 13 retention	65	65	56	1.12
		(495)	(939)	(408)	(99)
5) 50% or more	a) Diploma rate	24	27	25	23
$15,000 or more	b) Grade 13 rate	52	48	52	38
	c) Grade 13 retention	85	76	78	74
		(487)	(854)	(869)	(433)

N.B. Number of diploma recipients in parentheses. Four school districts omitted.

Table 7.7b

Grade 13 Diploma Recipients With Scholastic Aptitude Scores of 540 or more, by school district, Metro Toronto, 1972

School District Income Class	Number	Percentage	Ratio of these students in all diploma recipients
1) 90% or more under $10,000	220	6.6	19.4%
2) 30-90% under $10,000 and none 50% or more $15,000 or more	591	17.7	27.7
3) Less than 30% under $10,000 and none 90% or more between $10,000 and $15,000 and none 50% or more over $15,000	732	21.9	34.7
4) 90% or more between $10,000 and $15,000	777	23.2	40.0
5) 50% or more $15,000 or more	1027	30.6	38.9
All	3347	100.0	33.6

N.B. CRØS file data.

Earlier in this Chapter, using Census data, we found no reason to suppose that the ethnic composition of a neighbourhood had any influence on the Grade 13 attendance ratio. That result may now be checked by means of the ratio between diplomas awarded (reported by the Ministry of Education) and Grade 13 attendance (reported in the Census).[35a] As expected (see Appendix Table 7.8), there is no pattern discernible in this table. In half the cases, neighbourhoods identified as predominantly "British Isles" show higher ratios (controlling for income and home ownership) and in half the cases the reverse is true. One ratio is remarkably low, namely "all other, lowest income group and high home ownership". It could be that these are second generation, ghetto-ized youngsters. The data are sufficiently poor, however, and the number of persons in this cell sufficiently small so that no firm judgement is warranted. Remember in this connection that the Census rounded the numbers they reported, that they were based in any case on a one-third sample, that Census and Ministry of Education estimates of Grade 13 attendance differ, and that the number of diplomas found on the CRØS file is less than a full count.

Finding unusually good and poor schools

The search for ways of separating school from neighbourhood or parental influence has, as I feared and reported in Chapter 2, not been successful to this point. In the process of search, however, interesting characteristics of the general process by which some students receive Grade 13 diplomas while others do not have been uncovered. In a final effort to separate school and portmanteau neighbourhood effects, I look at "anomalous" schools and neighbourhoods.

35a These ratios, multiplied by the ratios reported earlier, will yield diploma rates out of the 18-19-year age group.

Secondary schools (and elementary school districts) with unusually high or low diploma or retention rates, holding average family income constant are called anomalous.[35] The data given in Appendix Tables 6, 7 and 8 permit such a search to be made and the resulting anomalies are reported in Appendix Table 7.9. It should be noted that the same school or district can (and does) appear on both "high" and "low" lists, e.g., a school could have a high retention rate coupled with a low diploma rate or conversely.

It is of interest to see in what way schools and districts that display high diploma or retention rates differ from those showing low rates -- with family income controlled. Some of the results are reported in Tables 7.8. Looking at anomalous schools, those with high rates give higher Grade 13 marks and therefore also award more Ontario Scholarships. There are no systematic differences in SACU scores nor in Grade 13 - SACU correlation coefficients. The high achievement schools do appear to enrol a smaller number of students from neighbourhoods that are mostly British Isles in ethnic identification but there are large variations in this and other variables within each group of schools. There are, however, distinct differences between the type and location of schools found on "high" as opposed to "low" lists. Of the 34 schools on the high list, 24 are private or Catholic; of the 30 schools on the low list, only

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35 Of the 104 schools for which data are available, 59 are defined as "anomalous", i.e., roughly the top and bottom 25 per cent of the schools in each income class. Dawson (1972) used Carnegie data in an attempt to find schools of "high quality".

Table 7.8a

Differences Between High and Low Achievement Schools, Metro Toronto 1971-72

School Income Class	Grade 13 Average	Ontario Scholar Rate		% British	SACU	SACU-613 Correlation
		1967	1971			
50% or more Rich						
High rates	72.6	21	22	79	544	56
Low rates	70.3	9	15	86	516	62
30-50% Rich						
High rates	72.3	19	30	56	508	50
Low rates	71.8	16	29	67	518	53
10-30% Rich						
High rates	70.6	10	20	63	496	54
Low rates	68.7	6	14	71	502	51
Less than 8% Rich						
High rates	69.5	7	16	43	479	44
Low rates	68.7	4	13	50	471	40

N.B. Unweighted averages are reported.

Table 7.8b

Difference Between High and Low Achievement

Elementary School Districts, Metro Toronto, 1971-72

School District Income Class	Grade 13 Average	Average SACU	% British Isles	% Public School	% Home Ownership
Income (5)*					
High rates	71.3	524	83	83	94
Low rates	69.9	524	98	83	76
Income (4)					
High rates	70.2	519	90	96	85
Low rates	69.8	507	74	92	67
Income (3)					
High rates	69.3	515	78	84	79
Low rates	69.4	503	80	87	73
Income (2)					
High rates	71.6	508	53	79	40
Low rates	69.9	496	46	85	31
Income (1)					
High rates	67.7	484	19	83	21
Low rates	68.4	485	55	94	15

* Income classes are those defined in Table 7.4.

four are private or Catholic.[36]

Next, I have tried to associate schools on the "high" and "low" lists found in Appendix Table 7.9[37] with the schools which serve the youngsters who reside in the elementary school districts also listed as anomalous.[38] The match is, however, none too good. Given the high incidence of private and Catholic schools on the anomalous list and the very low Grade 13 enrolment rates in poor districts, this is not surprising. In any event, the following schools display low ratios themselves and are also associated with low ratio districts: code numbers 687, 703, 800, 813, 930, 963, 1012, 1026.[39]

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36 Five of the 9 schools with low ratios serving low-income neighbourhoods are Toronto public schools but this may signify little since Toronto streams its students by school as well as programme. It is true, however, that of the 10 Toronto public schools on the entire anomalous list, 7 show low ratios. In contrast, of the 13 North York public schools on the entire list, 5 display low ratios. To complete the count, Scarborough public schools have 6 schools on the entire list of which 5 display low ratios; East York has 2 low and 1 high; York has 4 of which 3 are low; Etobicoke has 4, all low; Catholic schools appear 14 times, of which 12 are high; other private schools appear 10 times, of which 8 are high. (In these tabulations, schools appearing more than once were counted also more than once.)

37 Appendix Table 7.9 shows for each anomalous elementary school district the school attended by at least half of the youngsters in that district who received honours diplomas -- if there is one such school.

38 Remember, however, that public rather than separate elementary school districts have been used.

39 In order to obtain data on schools, I was obliged to keep confidential the names of schools and public school districts.

The following display high ratios and also serve high ratio districts: code numbers 505, 817, 919, 1020, 2054.[40] Attempts to discover differences between these two groups of schools (other than the marked fifferences in diploma rates which they display) have failed. The high group does have a significantly smaller percentage of students from EA's coded "British Isles" and does show a higher rank order correlation between SACU-average and SACU-math scores and a somewhat higher percentage of youngsters from very rich areas but it seems doubtful if these variations are sufficient to "explain" the observed differences in diploma rates.

Alternatively, the correlation between Grade 13 marks and SACU scores can be used to identify "good" and "poor" schools. Appendix Table 2 permits this to be done. Of the 26 schools with correlation coefficients greater than 0.6, 18 are private or Catholic. The code numbers of the high correlation public schools are: 508, 610, 722, 800, 813, 817, 1012, 3045. Only two are in poor neighbourhoods. Public schools with unusually low correlation coefficients (below 0.3) are coded: 550, 625, 731, 768, 805, 810, 1016.[41] All are in poor neighbourhoods and four of the seven are in the City of Toronto.

The conclusion I reach from the analysis just described is that schools can make a difference, i.e., the ratios used to sort schools and school districts into these extreme groups do not appear to be associated with pupil or neighbourhood characteristics in any systematic way. Hence, I assert the hypothesis that there are school

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40 A few schools on both lists enrol students from both high and low ratio districts and the following schools could have been put on both lists: code numbers 530, 722, 2061.

41 One private school and one Catholic school have low correlation coefficients and neither serves rich neighbourhoods.

characteristics which do make a difference. The problem is that the data available to me prevent a direct test of this hypothesis. Until data on teachers and principals are made available, one cannot be entirely sure what is going on. Perhaps those who have direct knowledge of schools will be able to discover whether the rather mechanical sorting procedures used here have identified truly anomalous schools.[42]

There is now a policy question: Should schools with unusually high diploma or retention rates (controling for type of neighbourhood) be judged "good", and conversely? The answer probably depends upon what roles are assigned to schools by the reader and the public at large. One could argue that schools serving rich neighbourhoods should have lower diploma rates for the same SACU scores than do schools serving poor neighbourhoods on grounds that scholastic aptitude tests are biased in favour of middle and uppor income youngsters. But how could this result be brought to pass? It is easy for rich families to move or send their children to private schools.

Let me now return to the problem of identifying "good" and "poor" schools located in low income neighbourhoods. As already mentioned, which youngsters will be excluded from the five-year academic stream and therefore, in most cases, denied the possibility of an Honours Diploma rests upon decisions made at the end of Grade 8. The secondary school could in principle make an independent judgement regarding programme when a student enters Grade 9 but this would be difficult to do and is not done. Hence, it is of interest to identify senior public schools according to the

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42 Most lists of "good schools", e.g., that provided by Ross (1976), are not interested in the value-added criteria that I am implicitly using and therefore list schools in neighbourhoods containing well-educated parents.

secondary school programme into which go their Grade 8 students. In a summary way, this was done earlier in Tables 3.1. Useful detail is provided in Appendix Table 7.10 for public schools in the City of Toronto; a lack of data prevents parallel tables from being constructed for the other boroughs. Appendix Table 10 also identifies the elementary school districts that feed students into each senior public school. On the basis of this table, it appears that schools coded 248 and 201 are better at putting youngsters into secondary school degree programmes than one would expect while schools 229, 252, and 262 are worse. It should be recognized, however, that a senior public school is limited in what can be accomplished by the quality of education in its elementary public feeder schools. Available data are insufficient to permit firm judgements on this important matter.

CHAPTER EIGHT

ON TO UNIVERSITY

Estimates

In this chapter and the appendix thereto, I estimate which students continued their formal education by enrolling in university. Resource limitations prohibited a parallel estimate of students who enrolled in community colleges. The reference group was all persons aged 18 or 19 at the time of the 1971 Census with a Metro Toronto residence. But for this cohort, only incomplete information is available. (1) By matching students found on the CRØS file with students listed on the 1972 data tape provided by the Ontario Universities Application Centre, one can estimate which Grade 13 diploma holders registered in an Ontario university directly or after a delay - but both of these files are incomplete. (2) With data from Statistics Canada and from foreign sources, one can estimate how many students registered in university in another province or outside Canada. (3) The 1971 Census reports how many persons stated that they were attending university full time and were in the first two years but had not yet obtained a degree. Only from the data described in (1) and (3) above, is it possible to extract university enrolment by neighbourhood characteristics and only from (1) can these enrolments also be broken down by individual secondary schools and universities.

The problem with these data is that no two sources agree regarding total registrations, and all are vague as to student residence or prior year educational activity. My estimates are that about 80 per cent of Grade 13 diploma recipients from Metro Toronto

enter university immediately following secondary school graduation. About ten per cent of these attend a university outside Ontario; this ten per cent is substantially above the average in scholastic aptitude and, of course, comes mostly from wealthy families. After working or travelling for a time another nine per cent will register in university and perhaps two per cent will attend as part-time students. In brief, about ninety per cent of Grade 13 diploma holders do register in university. Supporting evidence for these statements is found in the Appendix to this chapter and numbers are shown in Table 8.1.

There is an obvious implication of this 90 per cent figure. If all universities are lumped together, they do not really have an "admissions policy", i.e., as a group, they accept the judgements already made by secondary schools regarding the academic promise and preparation of applicants as affirmed by possession of Grade 13 diplomas. In terms of the present study, therefore, the process by which some youngsters reach university while others do not has already been discussed and analyzed.[43] In a formal sense, as has been seen, there appear to be two important school filters: the choice of a programme at the end of Grade 8 and successful completion of the Grade 13 year itself. Of course, family background, neighbourhood of residence and possibly genetic endowment largely determine whether or not these filters let through a particular student. Universities do, however, differ markedly one from the other and attention will be given in this chapter to the process by which students register in a particular university.

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43 Nonetheless, in the Appendix to this chapter, tables on university attenders and first-time registrants are given which parallel those earlier presented on neighbourhood characteristics of Grade 13 students.

Table 8.1

Estimate of University Registrations,

Metro Toronto, 1972

	Number		
In an Ontario university directly from Grade 13 (with 4 per cent added for undercounting)	8100	70.7%	
part-time	200	1.7%	
after a delay	1010	8.8%	
In a university in another province	150	1.3%	
In a university in the U.S.	550	4.8%	
In a university in another foreign country	50	0.4%	
Total	10060	87.7%	14.4%
All persons aged 18-19 years	69720		100.0%
Grade 13 attenders (September 1971)*	14977		21.5%
Grade 13 diploma recipients in 1972	11471	100.0%	16.5%

* Includes students "partially" in Grade 13.

Although about 90 per cent of Grade 13 diploma holders go on to university, only 70 per cent register directly in one or another Ontario university; in the remainder of this chapter attention is focussed on this 70 per cent. The first question then is in what ways do the students who apply to and register directly in Ontario universities taken collectively differ from all Grade 13 diploma recipients? Which students register in which non-Ontario universities I have not attempted to discover.[44]

I begin with summary Table 8.2 showing university applications and registrations of students from Grade 13 by neighbourhood characteristics, as reported to the Universities Application Centre.[45] As expected, school districts serving the relative rich send a higher proportion of their young people directly to university, and conversely. A higher percentage of applicants from the richest school districts also register in university but this is probably due to the stronger academic background and preparation of these students. As Appendix Tables 8.1 indicate, in their acceptances, Ontario universities do not appear to discriminate against a particular ethnic, religious, or income group, insofar as this can be detected from the neighbourhood data at hand. Care should, however, be exercised in interpreting this last statement. Clearly youngsters from poor neighbourhoods are less likely to be found in the five-year academic stream, complete Grade 13 and register in university. The universities could encourage

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44 Data provided by the Institute of International Education in Open Doors (annual) purport to answer this question but are grossly defective (see Appendix to this chapter).

45 As indicated in the Appendix, there is undercounting of applicants and registrants in this table. And applicants who delayed their applications by a year or more are ignored.

Table 8.2

Ontario University First Applications and Registrations, Metro Toronto, 1972

School District Income Class	University Applications	University Registrations		University Registrations as percentage of		
				Applications	Grade 13 diplomas	Census 18-19 yrs
	Number	Number	%			
1) 90% or more under $10000	967	670	10	69	59	4
2) 30-90% under $10000 and more 50% under $15000 or more	1884	1395	22	74	65	7
3) Less than 30% under $10000 and none 90% or more between $10000 and $15000 and none 50% or more over $15000	1820	1328	21	73	63	10
4) 90% or more between $10000 and $15000	1621	1116	17	69	57	10
5) 50% or more $15000 or more	2385	1889	30	79	71	19
All	8677	6398	100	74	64	9

applications from young people who come from other high school streams but government BIU rules do not encourage this policy. In brief, discrimination is present in the streaming which takes place in the school system and is also incorporated in government funding regulations for universities. Given these, the universities do not appear to discriminate. One should not be surprised either that discrimination by school does not seem to exist. After all, what the universities are getting from each school is the end-product of a long educational/screening process in which students from poorer neighbourhoods are subjected to much more severe screening than are students from richer ones.

If schools are classified by the average family income of the neighbourhoods served, there is also no indication of discrimination by Ontario universities, except in the case of night schools. Table 8.3 and Appendix Table 5 present data.

Table 8.3. First Acceptance Rate by School Group, Scholastic Aptitude and Grade 13 Mark for Ontario Universities; Applicants from Metro Toronto, 1972.

School Group*	Average Grade 13 Marks#				Average SACU Scores			
Public	59 or less	59-68	68-79	over 79	424 or less	424-480	480-540	540 or less
1% or less	46	88	95	98	76	84	92	94
(number)	(123)	(466)	(577)	(338)	(181)	(253)	(367)	(626)
1 - 21%	42	88	95	97	80	80	87	95
(number)	(200)	(572)	(594)	(385)	(266)	(345)	(427)	(627)
21 - 45%	34	88	94	98	74	83	87	94
(number)	(161)	(543)	(510)	(311)	(207)	(287)	(386)	(570)
over 45%	39	85	95	98	77	84	87	93
(number)	(246)	(910)	(844)	(399)	(434)	(467)	(584)	(710)
Private or Catholic								
1% or less	47	86	97	98	69	84	95	96
(number)	(17)	(111)	(158)	(87)	(29)	(64)	(73)	(192)
1 - 21%	21	84	95	96	82	89	88	94
(number)	(24)	(149)	(178)	(130)	(105)	(89)	(111)	(153)
21 - 45%	38	88	93	96	72	85	92	98
(number)	(32)	(119)	(125)	(67)	(65)	(66)	(72)	(114)
over 45%	0	89	90	92	64	84	97	95
(number)	(19)	(47)	(59)	(36)	(61)	(43)	(31)	(21)
Night Schools	50	17	42	64	50	50	50	75
	(4)	(6)	(12)	(25)	(18)	(4)	(4)	(4)

Average marks computed for courses taken in last year; some Grade 13 courses may have been taken earlier.

* Per cent of students in EA's with average income above $14,999 (See Table 7.5).

Note: Acceptances of first applications

School-University Interface: Some Theory

Although Ontario universities collectively do not appear to discriminate in acceptance -- except against students who come with low Grade 13 marks[46] -- individual universities may have different acceptance policies and to this matter I now turn.

If a university had a single decision maker (which it doesn't), he/she would, for maximum revenue, wish first to admit as many students as would qualify for the very profitable PhD-BIU status, then move on to MA-BIU status students, and so on down the line to provisional students in first year who would bring with them no BIU's at all until their second year (although they would bring tuition fees). The cutoff for this mythical university would come when there was no more physical space.

The presence of faculty members who cannot easily be discharged or retrained for different specialities makes more complicated the process just described but does not really change it. Each programme within each department has a "capacity" which depends, in what may be thought of as "stage one", upon the number of teaching hours and classroom spaces available. One may thus visualize the university as a set of containers of various sizes into which the decision maker pours students who carry with them different BIU values. He fills as many containers as he has available with high-value BIU students and then moves down the line to low-value BIU students. There is, however, a "stage two" to this process: When our imaginary decision maker is finished, some containers may be almost empty (because few

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46 Remember, however, that only Grade 13 marks received in 1971-72 are reported on the CRØS tape and 10-20 per cent of Grade 13 students take two or more years to complete Grade 13.

students are eligible or wish to undertake some programmes) and it is inequitable in the eyes of the faculty for some of its members to have substantially heavier teaching loads than do others. "Capacity" is thus redefined such that the percentage of the maximum number of students in the most nearly full containers does not exceed by more than some number the comparable percentage in the most nearly empty containers (after allowance has been made for outside research funding). In an overall popular university, the comparison would be made with similar faculties and programmes in other universities.

As the years roll by, the imaginary decision maker has an opportunity to adjust the size of the various containers in the university by hiring and firing and by replacing or not replacing faculty members who quit or retire. With tenure, however, this can be a slow process which is complicated by the desire of the typical faculty member for a leisurely life, coupled with the non-profit and market-protected nature of a university. It is also complicated by an inability to forecast accurately the characteristics of future applicants, and therefore, an inability to forecast accurately which containers should (for larger revenue) be expanded and which should be contracted.

It will be argued that, instead of assuming maximization of gross revenue as university motivation, I should have assumed maximization of net revenue. After all, admission of students into some programmes will add more to costs than to gross revenue. Universities are, like Niskanen's bureaucracies, prevented from showing a profit and are neither compelled nor induced internally to operate in a production efficient manner (Niskanen, 1971). Available cost data thus include

waste. A diagram will illustrate (see Figure 1). X_1 denotes the output level which maximizes total revenue (R). If waste were eliminated, the cost function would be C_2, and the upper breakeven output would be X_2. If this efficient "bureau" were to maximize gross revenue, output would be X_1 and $\overline{ab}$ would be profit. However, a university if not permitted to show a profit. Hence, waste is added to efficient costs and the cost function thus becomes C_1. X_1 thus appears to be the upper breakeven output. To obtain a solution for a model of this type, an assuption like maximization of gross revenue is needed and the constraints are the governmental rules governing revenue.[47] Costs become irrelevant - unless government's rules change so as to reduce the revenue function and waste cannot be eliminated in a timely manner, e.g., because of existing faculty tenure rules.

What implications has this informal model for the process by which a given university will accept one student while rejecting another? To find out I first arrange the universities in order of my guess regarding the market values of the baccalaureate degrees they offer. I do this because the best universities in this market sense are expected to have first choice of applicants. Appendix

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47 It may be difficult to establish empirically that the chosen output level maximizes the revenue function, i.e., if waste (and costs) were reduced and output were then increased, would revenue fall? Suppose that government is reluctant to increase revenue until waste has been reduced. In the text, therefore, I have implicitly assumed either that waste, once installed, cannot easily be discovered or removed or that what is viewed as waste by a university is not so viewed by government.

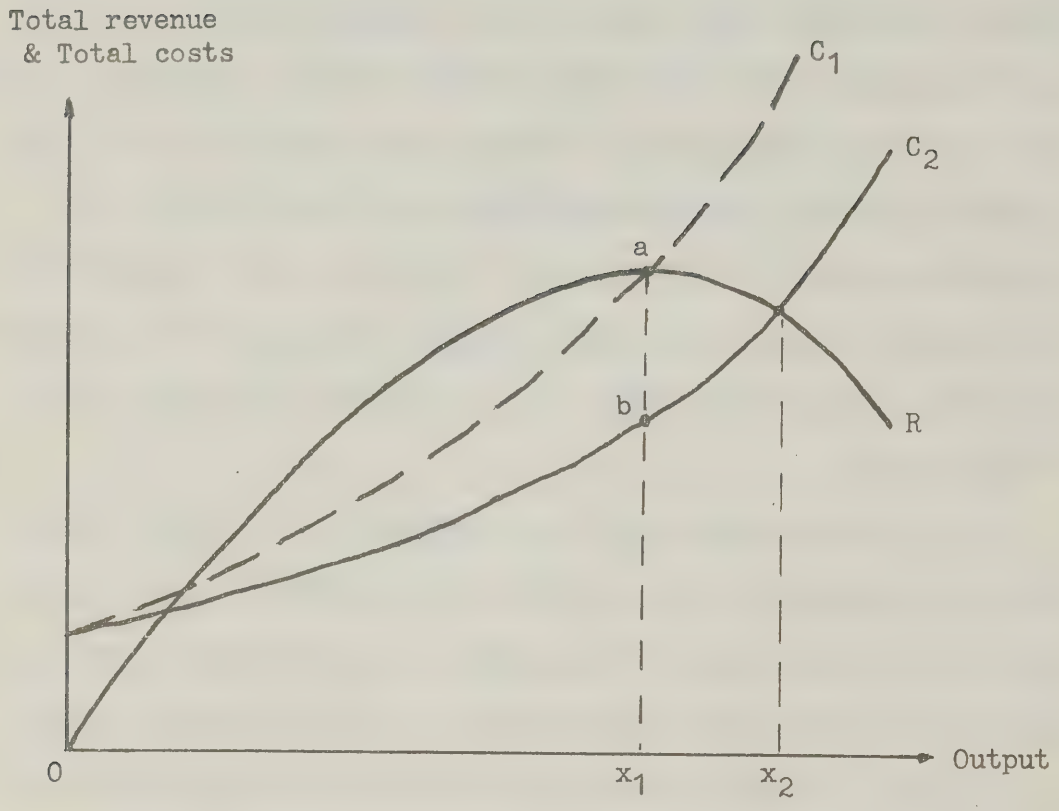

Figure 1

Revenue And Costs as Functions of Output
For a Mythical University

Tables 4 provide the data on which these guesses are based.[48] I have assumed that Ontario Scholars and students with high scholastic aptitude can, for the most part,go to whichever university they wish and will obtain more information about the relative quality of various universities. In any case, my grouping is as follows (in (d) I have combined several universities in which few students from Metro Toronto register):[49]

(a) Code 9

(b) Code 8, 11, 12

(c) Code 3, 6, 14, 18, 19

(d) All other Ontario universities.

Second, applicants should be arranged in order of the expected BIU revenue each will bring to a university. Since we are dealing with first-year applicants, this means a ranking based on the expected present value of the stream of future BIU revenues associated with each applicant from the vantage point of the admitting university. Direct data on these expected BIU values are not available.

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48 From U.S. data, Astin (1968) found that the "quality" of a university made virtually no difference to the scholastic performance of students, if student quality was held constant. However, Wales (1973) finds that the quality of a university does affect subsequent earnings, holding student quality constant. See also Solomon (1975).

49 Appendix Table 8.2 shows the relative dependance on graduate, high BIU students by university. I was obliged to treat as confidential the names of universities.

I suppose, however, that universities pay attention, as an indicator of these values, to the secondary school of origin and to the Grade 13 marks received by students. Universities have abandoned use of SACU scores, presumably on grounds that they are not useful.[50] Remembering the low rank order correlation coefficients between average marks and SACU scores reported earlier, it seems doubtful if this judgement was correct.

Third, recognize that a typical applicant is not altogether sure where in the ranking of all applicants to a particular university he/she will fall. Nor is a typical applicant entirely sure of the relative quality of the different universities and programmes. (And a university cannot be sure that its ranking of applicants is accurate.) So, to guard against error, a typical student makes application to two or three universities. And, while some applicants are rejected, between two and four times as many are accepted as the university expects will register (two times for Toronto and more than four times for Laurentian).

The government does in effect place an overall limit on the number of students in all universities by its control over construction of buildings and by its BIU rules and this is reflected in the fact that about a third of all applicants to first-year in 1972 (or about 20,000 persons) did not register in any Ontario

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50 This is odd since the more prestigious U.S. colleges and universities do use scholastic aptitude scores in their admission process and it is doubtful that Ontario universities are more knowledgeable about the high schools whence come applicants. These U.S. universities may place greater weight than do Ontario universities on the probability that an applicant will become economically successful in later life and give money to the university and jobs to subsequent graduates. The Educational Testing Service at Princeton reports that parental income and scholastic aptitude scores (but not average marks) are strongly and positively correlated over the entire range of income. (See College Bound, Annual, Table 21.)

university. Some of these "applicants who did not register" may have been rejected because they did not meet minimum admission standards or because they would bring too few BIU's with them -- given capacity limits; others may have left Ontario for university elsewhere; still others may have decided to postpone the decision whether to go to university. From available data, one cannot be sure how many applicants fall into each category.

School-University Interface: Some Data

In order to analyze the process just described (and to discover if the description makes empirical sense), I use data from the matched CRØS-OUAC file. Turn first to Table 8.4 in which first applications are reported by university group and average Grade 13 marks.[51] The decision regarding the composition of the student body in each group of universities is clearly being made by the applicants themselves, i.e., 70 per cent of the applicants to university group (a) come with average marks of 68 or better while the comparable percentage for group (c) or (d) is 40. Two-thirds of all academically successful students, but only one-quarter of those who did relatively poorly in Grade 13, made first applications to (a).

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51 The reader may wonder why only first applications and acceptances thereof have been used. After all, a third of the Metro applicants from Grade 13 made application to two universities in Ontario and half made three applications. For the bulk of students, however, first application indicates preferred university. Appendix Table 8.3 provides detailed information and suggests that only a few weak, apparently risk-averse students interchange their first and second choices. It may be possible to discover from the data tape how many (and which) applicants registered in their first choice university, how many in their second choice university, etc. This was not done, however, because of a problem of multiple registrations in the data which I "solved" by assuming that each applicant registered only once and then in the university standing highest in his/her preference ordering.

Table 8.4

First Applications by University Group and Grade 13 Average Mark, Metro Toronto, 1972

University Code	Grade 13 Average Mark* Less than 60	60-68	68-79	Over 79	All
(a) number	196	990	1610	1201	3997
row %	5	25	40	30	100
column %	24	34	53	67	46
(b) number	158	530	522	266	1476
row %	11	36	35	18	100
column %	19	18	17	15	17
(c) number	407	1275	827	272	2781
row %	15	46	30	10	100
column%	49	43	27	15	32
(d) number	67	148	106	42	363
row%	18	41	29	12	100
column%	8	5	3	2	4
All number	828	2943	3065	1781	8617
row%	10	34	36	21	100
column	100	100	100	100	100

* Of courses taken in 1971-72

In consequence of this application pattern, little remains for the universities to do when the time comes to accept or reject applications. The acceptance rates (of first applications) are shown in Table 8.5 together with the registration rates (calculated as a percentage of first acceptances). Group (d) universities have slightly higher acceptance rates of weaker students but more important are the differences in registration rates with (a) being significantly lower in the case of weaker students and higher in the case of stronger students. This is further evidence that universities play largely passive roles. One wonders why the universities spend so much time and money on admissions procedures. It may be argued, however, that if they did not, then students would not sort themselves so effectively. In brief, the hypothesis put forward above is not disconfirmed but is not strongly supported either -- perhaps because Ontario universities have excess capacity generally.[52]

Because of the earlier discussed correlation between average Grade 13 marks and scholastic aptitude scores, the student bodies of the various universities are not nearly as different in aptitude as the last two tables might suggest. Table 8.6 presents relevant data. To illustrate how to read this table, take the north-west cell. 6.4 per cent of all first applications came from students with SACU scores less than 424 who applied to (a). And 5.0 percent of all registrations fell into this same two-way category. With minor exceptions, the distribution of students over Ontario universities is the result of student decisions to which the universities acquiesce. Historical precedence seems overwhelmingly important.

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52 There is informal evidence that the minimum Grade 13 average mark needed to enter the more prestigious universities has recently risen.

Table 8.5

Acceptance and Registration Rates by University Group and Grade 13 Average Mark, Metro Toronto, 1972

University Code	Grade 13 Average Mark				
	Less than 60	60-68	68-79	Over 79	All
(a)					
Acceptance	36	80	94	98	89
Registration	87	76	87	95	85
(b)					
Acceptance	37	87	93	96	85
Registration	129	86	90	84	89
(c)					
Acceptance	37	91	96	96	85
Registration	102	85	75	73	81
(d)					
Acceptance	54	89	95	90	85
Registration	192	84	77	63	92
All					
Acceptance	38	87	94	97	83
Registration	115	88	87	91	93

N.B. Acceptance rate of first applications;

$$\text{Registration rate} = \frac{\text{all registrations}}{\text{acceptance of first applications}}$$

Table 8.6

First Applications and Registrations by Scholastic Aptitude and University Code, Metro Toronto, 1972

SACU Average Score

University Code	Less than 424	424-480	480-540	540 or more	All
(a)					
Application	6.4	8.3	11.5	20.4	46.6
Registration	5.2	7.6	11.9	23.5	48.2
(b)					
Application	2.3	3.6	4.4	6.8	17.1
Registration	2.4	3.3	4.5	7.4	17.6
(c)					
Application	7.5	7.2	8.6	9.0	32.2
Registration	6.6	7.3	7.8	8.1	29.8
(d)					
Application	0.8	1.0	1.0	1.3	4.1
Registration	0.8	1.0	1.1	1.4	4.4
All					
Application	17.0	20.1	25.5	37.4	100.0
Registration	15.0	19.2	25.3	40.5	100.0

In a fuller study, one would try to discover how these registratants fared in university and what happened to them after university. Although necessarily confidential, the matched file I have created does contain identification codes which would enable an investigator to find these students in a future year. In this connection, however, the reader should remember that the matched 1972 file contains only 8,617 students but that the list of Grade 13 diploma recipients from which this file was extracted has about 11,500 names. Perhaps 750 of all these attended university outside Ontario while an additional 1000 will go to university after a year or so and others will attend part time. Some clues regarding students from Grade 13 who are reported as not applying or as applying but not registering in an Ontario university are found in Tables 8.7. It seems likely that most of the 1000 or so highly qualified students identified in this table left the province for university or delayed their registrations. (See also Tables B.8 in the Appendix to this chapter.)

I conclude this section with data on intention to apply for financial assistance from the government (see Table 8.8). Lack of time and energy stopped me from comparing these intentions with actual loans and grants.[53] Clearly, a high percentage of students from well-to-do families do plan to make application and this is not surprising since repayment provisions and interest charges are most favourable. Incidentally, while the pattern by income is plain, there is no discernable pattern by ethnic identification -- once one controls for income.

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53 See Commission on Post-Secondary Education in Ontario (1971) for estimates of the size of OSAP awards in relation to parental income. Average loans and grants by university are reported annually by the Ministry of Colleges and Universities.

Table 8.7a

Apparent Non-registrants by SACU Score, Grade 13 Marks, and Family Income, Matched Files, Metro Toronto, 1972

	Did not apply	Applied but did not register	% Both of Grade 13 Diplomas
SACU Score			
Less than 424	209	463	42
424 - 480	290	457	38
480 - 540	236	534	33
540 or more	229	573	24
Not known	300	163	56
Grade 13 Average			
Less than 60	268	467	67
60 - 68	572	844	40
68 - 79	331	645	29
Over 79	93	234	18
Family income for Neighbourhood (in thousands of dollars)			
Less than 8	112	168	38
8 - 10	257	376	39
10 - 12	315	482	38
12 - 15	325	594	37
15 - 18	104	214	32
18 and over	116	342	26
Not known	35	15	47
All	1264	2191	35

Table 8.7b

Grade 13 Diploma Recipients With Scholastic Aptitude Score of 540 or More Who Did Not Apply or Who Did Not Register Directly in an Ontario University, Metro Toronto, 1972

School District Income Code*	Did not apply	Applied but did not register	Both as percentage of all diploma recipients with SACU scores of 540 or more
(1)	13	39	24
(2)	49	112	28
(3)	52	164	30
(4)	48	180	30
(5)	57	188	24
All	219	683	28

N.B. Data from matched CRØS - OUAC file.

* See Tables 7.4 for code.

Table 8.8

Intention to Apply for Financial Assistance

Metro Toronto Matched Students, 1972

Average family income (in thousands of dollars)	Per cent "yes"
Less than 8	
High home ownership	77
Low home ownership	76
8 - 10	
High home ownership	70
Low home ownership	72
10 - 12	
High home ownership	69
Low home ownership	72
12 - 15	
High home ownership	64
Low home ownership	70
15 - 18	
High home ownership	53
Low home ownership	49
18 or over	
High home ownership	36
Low home ownership	37
Unknown	39
All	60

A Digression on Judy and Fisher Estimates

To complete the description of students who go to university from Grade 13, one should also have estimates by family characteristics. At first glance, a serial publication of Statistics Canada (1963) seems to fill this gap. Closer examination, however, indicates that the data on family income there reported must be faulty. Since these data have been used both by Judy (1970) and Fisher (1970), I am obliged to demonstrate that they are indeed faulty.

Start with the data reported by Fisher which are reproduced in the first two columns of Table 8.9. The third column is the result of applying two assumptions to these data: (1) each family has the same number of children equally divided between males and females and (2) the overall percentage of the 19-24 age group attending university is 7.5 per cent, which is what it was in 1961. The first assumption is slightly wrong (poorer families are slightly larger than rich families) but a correction would only make smaller the percentages found near the top of the column and larger those found near the bottom. From the data in the table, the total income of the families of a randomly selected group of 100 students comes to about $765,000.

From the same survey of students, one can also find data on fathers' occupations and education and these are reproduced in Table 8.10. To these I have added average wage earnings as reported by Podoluk (1967). Using these data, one discovers that total wage earnings for parents of 100 randomly selected students comes to $618,000 (using the educational breakdown) and to $587,000 (using the occupational breakdown).

Table 8.9

Parents of University Students, Families and

Apparent University Enrolments by Family Income, Canada 1961

Family Income	Parents of Arts and Science Students	Income Tax Payers	Families with heads 45-54 yrs	Apparent Percentage of 19-24 yrs attending university from each income group
Less than $3,000	10.5	36.5	15.5	5.1
$3,000 - $4,999	21.0	41.7	26.3	6.0
$5,000 - $5,999	14.1	9.4	13.1	8.0
$6,000 - $7,999	17.9	7.1	19.9	6.7
$8,000 - $9,999	11.3	2.3	11.1	7.7
$10,000 - $14,999	13.6	1.8	9.8	10.4
$15,000 or more	11.6	1.2	4.2	20.7
All	100.0	100.0	100.0	7.5

N.B. See also Marsden and Harvey (1971)

Table 8.10

Parents, Families and Apparent University Enrolments

by Parental Education and Occupation, Canada 1961

Father's Education	Average Wage Earnings	Father's of Arts & Science Students	All Family Heads Maintaining own Home Aged 45-54	Apparent Percentage of 19-24 year olds attending University
University degree	$10,821	20.6%	5.6%	27.7%
Some university	6,882	9.1	3.3	20.6
High school grad.	6,130	19.8	17.3	8.6
Some high school	4,756	24.0	28.0	6.4
Elem school or less	3,648	26.5	45.8	4.3
Total		100.0%	100.0%	7.5%
Father's Occupation			Married Males 45-54 Years	
Managerial	$7,562	27.0%	16.3%	12.4%
Professional	8,251	19.8	6.5	22.8
Commercial, Clerical Sales	4,600	12.2	10.4	8.8
Transport Communication	5,524	5.7	6.9	6.2
Mfg. Mech., Construction	3,989	14.3	30.7	3.5
Service & Recreation	3,620	6.2	6.8	6.8
Farmers & Farm Labour	-?-	7.4	12.6	4.4
Other primary	2,200	2.8	3.2	6.6
Labourers	2,652	1.6	4.9	2.4
All others Not Reported	-?-	3.0	1.7	12.9
		100.0%	100.0%	7.5%

Note: 57% of all university students have parents aged 45-54 years.

To these wage earnings one must add (1) wage earnings of family members other than the family head, which are roughly one-quarter of the head's earnings and (2) non-wage income of the family, which comes to about one-third of wage earnings. The result is a crude estimate of $1,000,000 for total family income of 100 students. And it is plausible to suppose that families with youngsters at university will earn more than the average for their reference groups. Hence, an estimate of $1,200,000 would not be out of place. This is substantially larger than $765,000.

On other grounds also, one would expect bias in the data used by Judy and Fisher. Of the sample of university students used to construct Table 8.9, 15 per cent chose not to answer any questions put and 18 per cent of those who did answer chose to provide no information about parental income. Further, it seems unlikely that students have an accurate picture of their family's financial situation nor a clear understanding of how "family income" is defined (Radner and Miller, 1975). Finally, it is well known that, for census purposes, the rich tend to underreport income, especially investment income and it is plausible to suppose that the children of the rich behave in like manner.

I have included in Table 8.10 the apparent percentage of those 19-24 years of age at university estimated as described above. Probably these estimates are biased also since some inflationary reporting of parental education and occupation is to be expected. The figures are, however, impressionistically plausible (ECC, 1971). Of greater interest is a comparison between 1961 and 1971 since, if the same amount of bias is present in both years, the change between them will be accurate. Table 8.11 shows this comparison, using father's occupation.

Table 8.11

Apparent Percentage of Persons Aged 19-24 Attending University by Father's Education, Canada, 1961-1971

Father's Education	Apparent Attendance University 1961	Father's of Arts & Science Students 1968-69	All Family Heads Maintaining own home aged 45-54 1971	Apparent Attendance 1968-71
University degree	27.7%	18.1%	6.5	44.6%
Some university	20.5	7.3	5.1	22.9
High school grad	8.6	24.1	14.2	27.2
Some high school	6.4	22.2	31.7	11.2
Elem school or less	4.3	28.3	42.5	10.6
Total	7.5%	100.0%	100.0%	16.0%

Over the past decade, universities did become more accessible to young people from both rich and poor families. At the same time, obviously, the percentage of the age group going to university rose. Cocktail party analysts have taken these facts as evidence that the "quality" of university students has fallen. They buttress this belief by the much-publicized decline in the average score of students taking the Princeton Educational Testing Service's SAT.

In Toronto, as we saw in Chapter 6, direct evidence on comparative "quality" is hard to find. On logical grounds, the evidence is compatible with either a decline or an improvement or with no change at all in quality. While it is probably true that the extra youngsters from rich homes will have lower than average scholastic aptitude, those coming from poorer homes are likely to be smarter than the average.[54]

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54 The Princeton Educational Testing Service data conform with this possibility since the SAT is required for entrance, for the most part, in fairly expensive private colleges. Poorer youngsters are more likely to go to State and community colleges and universities. In any case, in the U.S., about half of the age group goes to college or university while in Canada the comparable percentage is less than 25. During the period when the U.S. was increasing university attendance from, say, 20 to 40 per cent, evidence of declining quality was not apparent. See also in this general connection, Taubman and Wales (1972).

CHAPTER NINE

SOME COST-BENEFIT CALCULATIONS

Currently Ontario, through its elected representatives, has decided that every child shall stay in school until the age of sixteen. Although attendance is voluntary thereafter, about 45 per cent stay for more than a Grade 12 high school diploma. Substantial rewards are provided for those who do stay but, as if to prevent the burden on taxpayers from becoming so large that politicians lose elections, some students are discouraged from continuing into Grade 13 and beyond. As we have seen, the process of selecting who will and who will not continue begins virtually at birth and is recognized formally in the choice of programme made when students enter secondary school. Those who believe that a public, tax-supported educational system is able to compensate for differences in family background and neighbourhood and provide an equal start for all children will have been disappointed by the data presented earlier. More jaundiced or realistic readers will not have been surprised to learn that the rewards of subsidized higher education are reserved largely for children from affluent homes who live in neighbourhoods where most families are also well-to-do.

To gain support for an educational system from those who have not and whose children will not benefit directly, educators and others have argued that there are substantial induced or trickle-down benefits from education in the form of a higher overall rate of economic growth, a lower rate of unemployment and, in general, a better managed society. Although the premise may be true, namely that education has improved

mankind's lot, the conclusion that the present educational system is (except for minor changes) well designed for the task is probably false. The selection system practised by schools does put some intellectually weak youngsters into university and presumably then into relatively important positions. At the same time, it directs a great many highly capable youngsters into occupations that require little ability and that also damage hopes and aspirations. By inference, schooling seems well designed to maintain the status quo (Brown, 1972; Bowles, 1972). It thus provides insurance for children from economically successful families but, for this reason, does not serve well the needs of youngsters from poorer families, especially if they are put into a non-diploma secondary school program.

Given a society that operates with majority rule and in which the affluent do join one another in the same neighbourhoods and support their children through university and into marriage, it is difficult to see whence social change from education will come. Before investigating possibilities, however, evidential support should be provided for the remarks just made.

Assumptions

Although it is obvious that a great deal of public money is spent on the education of those students who stay in school beyond school-leaving age, the argument is often made that those who do stay on will pay back later in life in higher taxes much more than was spent on their post-school leaving age education. Indeed, the claim is made by some parents that taxes on the well educated are so high that incentives to continue in school are being eroded. It is important to investigate this issue even though adequate and accurate data are

unavailable. In lieu of these missing data, crude empirical assumptions must serve (Lacombe, 1973). Here are those I will use:

1) The direct cost to taxpayers of each year of secondary school is $1100 per pupil; government payments to university on behalf of each student are $1300 a year for an ordinary degree and $900 more than this in the last two years for honours and some professional degrees. From the amounts spent on behalf of university students, however, I deduct one-quarter to reflect the fraction of university expenditures that are devoted to research and public service rather than to teaching.
2) Income before taxes for those who are working rather than going to school is assumed to be $2880 ($1.50 per hour) for those aged 17 or 18; $3840 for those 19 or 20; $4800 for 21-year olds; $5280 or $5760 for 22-year olds, depending upon whether or not the person has an ordinary degree. Summer earnings of those in school are assumed to be one-sixth of the above-stated amounts. Full employment is assumed.
3) Tuition fees and books while at university are taken to be $700 a year, but grants and subsidized loans reduce this amount for many students (West, 1975). I take the average loan to be $750 per annum and assume that half of all students obtain loans. Hence, the "expected value" of the loan subsidy is half of the difference between the market rate of interest and the rate charged on the student loan multiplied by the amount borrowed. While the student is at university, this comes to $37.50 a year on each $750 unit of borrowing; after leaving university, it comes to about $24 on each unit

in the first year, $11 in the second year and then declines to zero over the next 5-10 years. About 25 per cent of all students receive grants on top of loans and the average grant is $600, i.e., the expected value for the "average student" is $150 per annum. Students who default on their loans receive what amounts to an extra grant. Since I take the default rate to be about 5 per cent, the expected value of this "grant" to the average student is $19 per unit borrowed. These loan subsidies and grants are, of course, borne by the taxpayer.

4) Interest on money borrowed to cover living expenses is a private cost of schooling beyond school-leaving age. Because of parental and other gifts, as well as summer and part-time earnings, however, interest payments are not large. I assume that private student debt comes to $500 for each year in university and that the interest rate is six per cent co mpounded on this debt.

5) Those not in school or university are assumed to be working and pay taxes (all taxes, not just income taxes) at the rate of 30 per cent. Remember that full employment has been assumed. Those in school are assumed to pay no income taxes but do pay other taxes on summer earnings at the rate of 7 per cent. (Tuition fees may be subtracted from earnings for tax purposes.) Finally, a university student brings to someone a deduction of $400 which is assumed to mean an income tax reduction of $140 for a parent.

6) Other types of post-secondary school education and schooling beyond four years of university have been ignored. This

introduces error but simplifies data collection.

The estimates generated by these assumptions for the six years immediately following school-leaving age are found in Appendix Table 9.1, where a discount rate of four per cent has been used to compute present values back to school-leaving age. All these assumptions are, it is believed, appropriate for the early 1970's.

Notice that no allowance has been made for differences in unemployment rates across the several educational groups listed in the table nor for wage differentials arising from sex or ethnic-based discrimination. This is because schooling should not be made to carry burdens attributable to economic waste in other parts of the economy, i.e., one wishes to compute costs and benefits of schooling as they would be if the rest of the economy were functioning properly. For this same reason, however, no reduction for waste within the educational system has been made. Although waste may be a prominent feature of education, it is not attributable to the rest of the economy. It could be that too little has been taken out for research and public service undertaken in universities but there seem to be no data with which to argue one way or the other; the estimate of one-quarter comes from a comparison of the lengths of academic and calendar years. A discount rate of four per cent will strike some readers as too low and other readers as too high, even though computations are, implicitly, in real terms. In the last columns of Appendix Table 9.1, the consequences of using two per cent and eight per cent instead of four per cent are reported.

Appendix Table 9.1 is of little interest in itself since each schooling group is carried forward only to age 22. The next question

is what happens thereafter? What are the present values (at school-leaving age) of future earnings and of future taxes collected from these earnings? To answer these questions, additional empirical assumptions are needed and are stated in Figure 2.[55]

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55 The profiles are derived in a judgemental and crude way from data found in Hanoch (1965), from Podoluk (1967, Chapter 6 and Appendix), and from Income of Individuals, 1971 Census of Canada (Cat.No. 94-763, Tables 9 and 10). The estimates in Figure 1 above are for males. Some incomes taken from Table 9 of the last-mentioned source may be of interest:

Education	Income of age group 50-54	
	Male	Female
Grade 11	$9519	$3668
Grades 12/13	$10682	$4221
Some university	$12157	$5429
University degree	$20672	$8397

(Note that no correction has been made for number of days worked in the year or for number of years of work experience.)

Since making the computations leading to Figure 2, I discovered Statistics Canada (1974). Chart 1 and Table 3 therein give age-education income profiles for Canada for 1967 but do not distinguish between an ordinary and an honours degree nor between Grade 12 and Grade 13 diplomas. Fortunately, the two sets of profiles are nearly the same. For comparison, here are the income differences shown in Figure 2 and found in this Statistics Canada study for males at age 50:

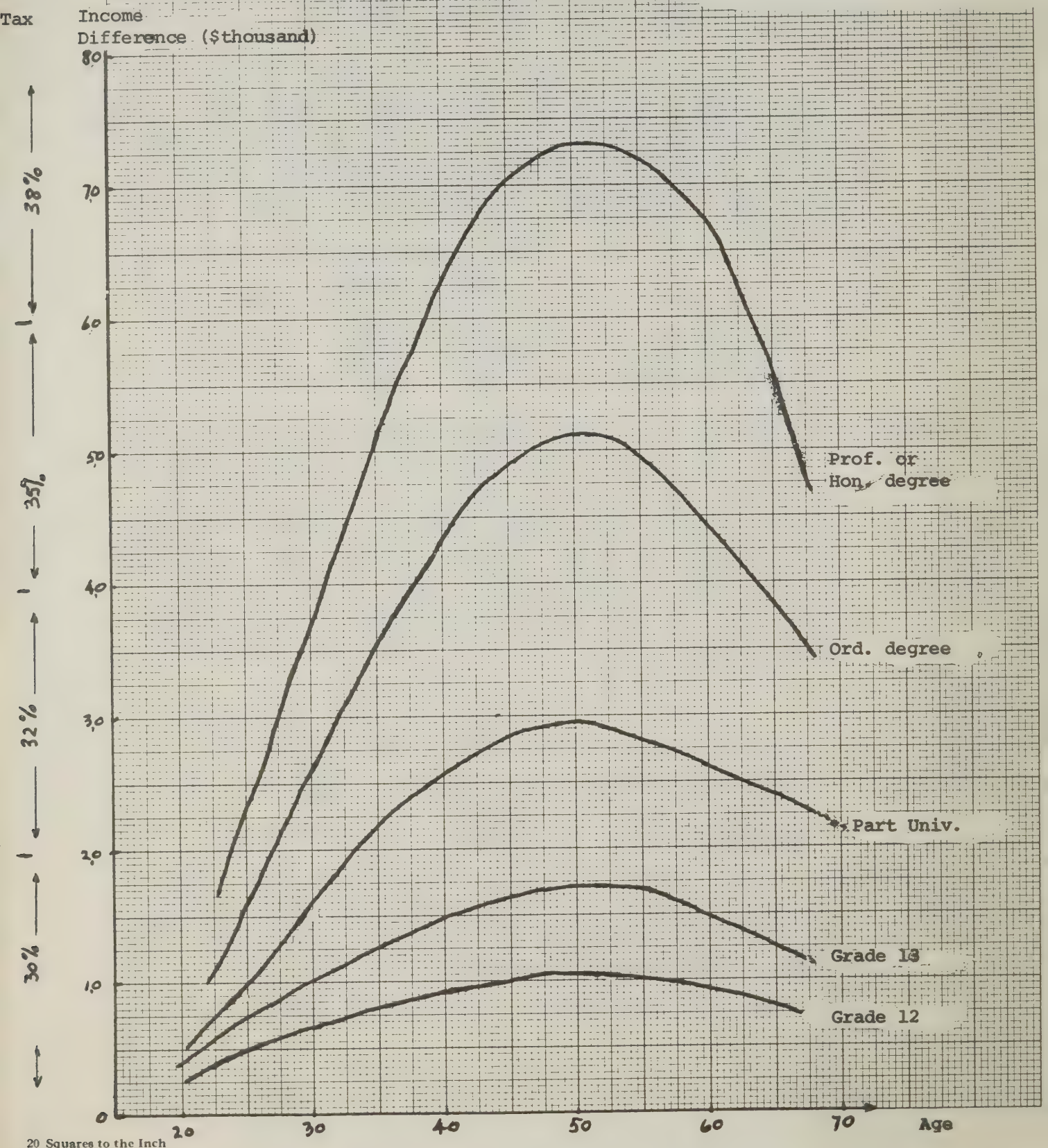
	Figure 2	Statistics Canada
High School Grade 12	$1050	$1400
High School Grade 13	$1700	
Some university	$2950	$2650
Ordinary degree	$5100	$7400
Honours degree	$7300	

It may be, therefore, that the earnings of university graduates in Ontario have been set too low by me but the Statistics Canada data include gross earnings from self employment and thus include more than earnings from employment.

Figure 2

Income Profiles by Educational Level

N.B. Alan Maslove (1972) believes that the tax structure is less progressive than is here assumed.



20 Squares to the Inch

The base line of Figure 2 is the cross-section, age-income profile of persons who stopped their schooling at age 16, i.e., the profiles pictured are differences above this base line. On the vertical axis are found numbers of dollars and also the tax rates used in computations. The tax rates assumed are probably more progressive than are current rates. I have arbitrarily and quite conservatively supposed that any income received or taxes paid after the age of 67 is irrelevant to the comparisons being made.

The earnings profiles should not, of course, be interpreted to mean that a person's income will fall markedly after the age of fifty. This characteristic of the profiles is only the result of using cross-section data (Eckaus, 1973). Further, the profiles would be different if, matching assumptions I have made, there were neither unemployment nor sex discrimination. For present purposes, however, the differences between the profiles may be used as a basis for calculations.

Calculations

The assumptions just made generate the numbers found in Table 9.1, again using a four per cent discount rate. In the last column, however, the end products of parallel calculations are reported using two and eight per cent discount rates. In these computations, what I am doing is treating public expenditures on a person's education plus taxes lost to the public treasury because a student is in school rather than gainfully employed as a "loan" from society which is to be repaid out of subsequent earnings. Implicitly, then, I am assuming that the extra income associated with more schooling is captured by the recipient of the schooling

Table 9.1

Subsequent Extra Earnings, Extra Taxes Paid, Educational "Debt"

by Level of Schooling for Males (All in Present Values at 4 Per Cent Discount Rate) to Age 67

Left school after:	Extra earnings (before taxes)	Extra taxes paid	Educational "Debt"	Implied tax rate* on extra earnings	Previous column if discount rate is: 2%	8%
Grade 11	$ 0	$ 0	$ 0	0%	0%	0%
Grade 12	$14527	$4340	$1930	19%	23%	3%
Grade 13	$22643	$6765	$3787	16%	21%	-8%
University I)) University II)	$36385	$11410	$7058	15%	22%	-19%
University III	$59732	$20025	$10506	19%	26%	-9%
University IV	$85220	$30602	$13880	23%	29%	-1%

* Educational "debt" has been subtracted from both extra earnings and extra taxes paid before computing these percentages.

N.B. University I and University II are combined using the ratio 54:46.

(i.e., that externalities are negligible) and that, even if the economy is growing, income differentials will remain as depicted in Figure 2.

Readers who believe that wages equal marginal productivities will be happier with these assumptions than will readers who believe that wages are distorted from marginal productivities by monopoly, discrimination and nepotism or who believe that well-educated people produce relatively many public goods and positive externalities for which they are not fully recompensed. However, extra money income is only one part of the extra benefit obtained by the well educated; in addition, they usually get more interesting jobs, work in more attractive surroundings and are closer to the top of social and work pecking orders. (Carnegie Commission, 1973; Duncan, 1976.) Further, as Arrow (1973) has recently and forcefully brought to our attention, insofar as an educational system gives credentials to some while denying credentials to others with equal capabilities, education is simply redistributing income towards those with credentials -- and is loading charges for so doing onto all taxpayers, to the net disadvantage of those without credentials (Solow, 1965; Taubman and Wales, 1974).

In any case, the reader may modify and interpret the last columns in Table 9.1 as he/she will. Remember, however, that the tax rate applied to the incomes of those who left school at sixteen (and to these same amounts of income by whomever received) is 30 per cent. Although many of the assumptions lying behind Table 9.1 are questionable, it seems doubtful if different plausible assumptions could push "tax rates" on the extra earnings of Table 9.1 much above the levels there reported or make the individual rates substantially more progressive.

The relatively low "marginal" tax rates shown in Table 9.1 might be appropriate if the benefits of what government provides and pays for with tax receipts go mainly to those with little education. It seems most doubtful, however, if this is the case. Older estimates for Ontario by Johnson (1967) of the distribution of benefits arising from government expenditures (including transfer payments), coupled with modifications forced by the more recent approach of Niskanen (1971), suggest that (except for the very poor and the very rich) benefits are likely to be distributed more than in proportion to before-tax incomes.

In Table 9.2 are found comparisons of the extra earnings associated with education past school-leaving age with the private expenditures required to obtain this education and these earnings. If the estimates given are accurate, this extra education is associated with very substantial monetary advantages. These would not vanish if students were obliged to repay the public costs of their education. And I have disregarded the lower unemployment rates that typically accompany more education. Even if a ratio were unity, the non-monetary advantages of possessing greater knowledge, of working in pleasanter surroundings and being higher in society's pecking order would still be present.

Of course, the extra earnings given in Tables 9.1 and used in Table 9.2 are mostly associated indirectly with schooling (Leibowitz, 1976). In fact, the implicit rates of return found in Table 9.2 are a hodge-podge, part of which comes from genetic endowment, part from early parental training, part from neighbourhood and peer-group influence, part from schooling, part just luck (Taubman, 1976; Welland, 1976; Griliches, 1975).

Table 9.2

Net Extra Earnings in Comparison to Private Educational Expenditures by Level of Schooling for Males (All in Present Values at 4 Per Cent)

Left school after:	Net extra earnings*	Net extra earnings ÷ private educational expenditures	Previous column after deduction for repayment of educational "debt"	Previous column after additional deduction for extra child-rearing costs
Grade 11	$ 0	0	0	0
Grade 12	$ 8617	5.5	4.8	4.3
Grade 13	$12799	4.2	3.5	3.1
University I)) University II)	$18405	2.8	2.3	2.1
University III	$29609	2.9	2.4	2.2
University IV	$41762	3.2	2.7	2.4

* After extra taxes and private educational expenditures.

It may be argued that the estimates just presented will, after the fact, prove to be much too high, i.e., that the expansion of post-secondary education during the past two decades will soon greatly narrow income differentials. Between 1961 and 1974 there is evidence of such narrowing (Freeman, 1975, 1976). It may also be argued that the earnings to investment ratios (in present values) found in Table 9.2 should be reduced because of risk, expectations of future income and telescopic personal time horizons, i.e., there should be an additional discount on grounds that people much prefer their benefits to come soon and are risk averse.[56] Variance, however, appears to narrow as level of schooling rises which suggests that the numbers in Table 9.2 should not, for this reason, be made larger as the level of schooling increases (Brown and Reynolds, 1975). But, in fact, they do become larger for those who complete university.

Finally, it may be argued that I should have used a different (and much higher) discount rate for repayment of educational debt, i.e., that the numbers in the column labelled "private expenditures on education" should be larger than shown. For students who must borrow privately -- perhaps because they must contribute to the support of their parents and younger siblings -- this is true. Such students may also be unable to get as good jobs after graduation from university as can youngsters who come from more affluent homes. After World War II, students who graduated from university with the assistance of federal payments to veterans had higher marks but had

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56 Cross-section data do suggest that variance of future income for persons with a given level of schooling is quite large (see 1971 Census, Income of Individuals).

lower subsequent earnings than did (younger) non-veterans who graduated at the same time.[57] If the numbers in Table 9.2 are the right order of magnitude, however, it seems doubtful whether the sorts of corrections suggested by such remarks would much change the overall results.[58]

One correction should probably be made to the after-tax future earnings given in Table 9.2. Notice that subtractions have been made for private expenditures on education past school-leaving age and for repayment of public expenditures, but that the costs of child rearing up to school leaving have been ignored. Implicitly, therefore, these costs have been assumed invariant to the educational level of parents. But they are not. Since earnings increase with education, so also must income foregone while parents drop out of the labour force to rear their young children. And middle class females appear to spend more time with their children than do low income parents, as well as more money.[59] Further, richer and

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57 Several U.S. studies found this seemingly odd result but I have been unable to locate parallel Canadian studies.

58 From a social point of view, an appropriate "social" discount rate should be used which will be lower than the market rate of interest (net of inflation) and could be close to zero. There are the moral questions of the relative importance of different generations and the proper growth rate of population on the one hand and questions of a pseudo-empirical nature regarding the rate of technological progress and the stock and future importance of exhaustible resources on the other hand. There are also limitations that arise because, given market rates of interest, a proper mixture of different types of investment is desired. See Arrow and Kurz (1970, Chapter 1).

59 Discrimination reduces the monetary benefits of education to the recipient and thus also the amount of education demanded. In consequence, on "economic grounds", the family member who stays home should be female -- an additional social cost of discrimination. See Arrow (1971b) and Zellner (1972).

better educated parents have children who will remain in school longer and thus will receive large parental gifts while in school. On the basis of almost no evidence, I take these extra costs to be ten per cent of extra earnings after deductions for private and for public educational expenditures (in present values). The results are summarized in the last column of Table 9.2.[60]

In Table 9.3, the estimates given above are applied to pupils in City of Toronto public schools divided by neighbourhood as described in Table 3.1 above. The first column in this table is the result of multiplying column six of Appendix Table 9.1 by the implied numbers of students found in Table 3.1b; the third column is the result for parallel computation -- using the second column of Table 9.1; the next to the last column uses the first column of Table 9.2 in the same way.

I conclude that society has: (1) made education beyond school-leaving age an attractive investment but has then (2) blocked access to this investment opportunity by streaming most children away from five-year academic programmes in secondary school. If one assumes that each of the student/school groups of Table 9.3 are drawn from the same genetic pool, these conclusions are even stronger. In consequence, (3) those who benefit most from schooling past age sixteen are the children of more affluent families who were trained by parents and encouraged by peer-group conformity to score high on reading ability and other tests and then enter five-year academic programmes. Radical critics argue that this is or should be obvious since the more affluent "control" society (Starrett, 1976).

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60 An alternative approach which, under an assumption of equilibrium, should come to the same thing would be to subtract from extra earnings the amount required to repay parents after their retirement for the extra costs they incurred in rearing the youngsters described in the tables.

Table 9.3

Net Public Educational Expenditures and Extra Taxes Collected by Groups of Students (Discounted at 4 Per Cent to School-leaving Age)

Student/ School Group *	Net Public Expenditures		Extra Taxes		Difference		Net Extra Earnings	
	Total	Per student	Total	Per student	Total	Per student	Total	Per student
I	$ 446,100	$ 630	$9,754,830	$13,760	$ 9,308,730	$13,130	$14,880,730	$20,990
II	- 328,350	- 580	6,441,920	11,480	6,770,270	12,070	9,744,070	17,370
III	- 7,375,600	- 3,320	13,329,540	6,000	20,705,140	9,320	21,234,980	9,560
IV	- 8,273,300	- 4,300	7,871,660	4,090	16,144,990	8,390	12,901,230	6,700

N.B. Presence of CAAT's is ignored. Retention rates in university are taken from Student Progress Through the Schools, Statistics Canada Cat.No.81-513 and are:

University	I	100%
"	II	82%
"	III	70%
"	IV	35%

The column labelled "Difference" will be too low at the top and too high at the bottom insofar as students from more affluent families receive lower than average loan, grant and tax benefits. See also M. Wisenthal (1973).

CHAPTER TEN

TOWARDS EDUCATIONAL POLICY I

Policy Constraints and Objectives

Economists, desirous of equalizing marginal rates of return across all investment opportunities in order to achieve efficiency, think in terms of (1) making the marginal private cost of an extra year of education (tuition fees, books and income foregone) equal the associated additional benefits. Recognizing that the prior income distribution may be inequitable but believing that the set of Pareto Optimal social states contains a subset of "equitable" social states, many economists then advocate (2) changing the operation of the capital market for student loans (Brainard, 1974), and (3) changing the prior income distribution by direct wealth transfers. Many students and parents however, oppose such suggestions and politicians consider them impractical.[61] Many teachers and

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61 Neo-classical economists have asserted over several decades that confusion is the consequence of a failure to distinguish between questions of efficiency on the one hand and questions of equity or social justice on the other hand. In context, equity is a hazy, political desideratum which translates into some mixture of historical continuity and egalitarianism. Efficiency is interpreted to mean Pareto Optimality, i.e., minimizing the cost of achieving a predetermined goal or (equivalently) maximizing movement toward this goal with resources being fixed. It is generally assumed that there is no conflict between equity and efficiency, i.e., that, at each moment of time, the efficient set of possible social states will contain a subset which is equitable or (equivalently) that the set of equitable social states will contain a subset which is efficient. As L. Hurwicz (1975) has recently pointed out, Pareto Optimality is almost certainly incompatible with democratic decision rules.

administrators in secondary schools and universities also oppose them. It could be that this opposition rests on desires to perpetuate an educational system which permits some students to benefit at the expense of others and which makes it possible for school functionaries to share in the profits of those who gain.

This scenario would be correct in a selfish world in which voters would only approve policies from which a majority are expected to gain. Under democratic voting rules, this would mean that the "marginal voter" (who lies near the fiftieth percentile) believes that he/she will at least break even from each policy which is adopted. What the bottom fifty per cent believe (or vote) does not matter -- unless they engage in confrontation politics. Since immigrants do not vote during the first years of Canadian residency, since poor families vote in smaller proportion than do rich or middle-income families, and since middle-income families aspire to upper-class values, a majority of voters will choose policies which somewhat favour the interests of middle and upper income groups. If rich voters are clever or hire persons who are clever at public relations and the use of mass media, and can influence politicians directly, this bias in voting behaviour will be accentuated (Mueller, 1976).

If this scenario is correct, change will not come to the educational system until political pressure is successfully exerted by those who benefit least from it, e.g., those without children, those whose children will be or have already been streamed away from five-year academic programmes and those whose children attend private schools or will attend universities outside Ontario. Even if these three disparate groups could be organized for lobbying and

voting purposes, major change of the sort advocated by economists might not be forthcoming because lower income voters are not influential. In sum then, I conclude that the great expansion in post-school-leaving-age education of the past thirty years has been responsive to the wishes of the marginal voter.[62]

An apparent criticism of this interpretation is the current weakening of voter support for higher education. Has the marginal voter really noticed or anticipated a drop in the (private) rate of return to higher education? Does he/she find a higher rate of return associated with public subsidies for medical care, public transport, transfer payments to the poor, the unemployed and those past retirement age? While such suppositions are certainly conceivable, evidence is difficult to find and, in any case, they strike me as being implausible.

Let me try another interpretation. Suppose public support of education past school-leaving age is seen by voters as a set of prizes reserved for the smartest and most diligent members of each generation . The size of each prize and the percentage of each generation to receive prizes are determined by the expected utility function of the marginal voter, i.e., the value of the prize in expected utility should not be less than the value of the required extra taxes, also computed in expected utility (both in present values). Now start twenty-five years ago with about 5 per cent of the relevant age group entering university. This is such a small percentage that

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62 It has been argued that political pressures will redistribute income (by means of taxation plus benefits of public expenditures) away from both the poor and the rich towards the middle. See Stigler (1970).

the marginal voter would not be surprised to discover that his/her own children were not selected for prizes, so long as not all prizes went to upper income students. When the percentage of the age group rises to 20-25 per cent, however, the marginal voter would be surprised if one of his/her own children or the child of a friend was not selected. In due time, the marginal voter would suspect that the criteria used for selection were biased and the game was unfair. Adding these various partial explanations together, it could be that the expansion of higher education of the past few decades and current voter objections are compatible.

In terms of educational policy, what significance has this package of explanations? (1) Selection for higher education must seem fair to the marginal voters, e.g., 10-15 per cent of their children should enter university if the overall average is 20 per cent and (2) those who do complete university should not capture for themselves the full value of the services they supply to marginal voters, i.e., university graduates should seem to supply positive externalities to those marginal voters who are not and whose children will not be university graduates. The economist's suggestions, namely remove "imperfections" from the student loan market, redistribute wealth directly and then let tuition fees rise until the costs of higher education are covered (as they could be with marginal cost pricing if there are not important indivisibilities or increasing returns to scale) would seem to meet these policy constraints. They would, however, fail the voter test under which the wishes of the lower income half of the voters are mostly ineffective.

To find other guides for policy, think of society as consisting

of a number of "families" each of which desires a life span of many generations. Suppose further that each "family" considers itself to be at least as valuable to society and as deserving as any other family. If the number of members of each family and the number of families were both constants over time and if society's pure rate of time discount were zero (Ramsey, 1928; Stiglitz, 1969; Blinder, 1973), then the total income received by every family over society's life span should be the same. In any one generation, however, the incomes received by the various families could, of course, be unequal; a poor generation of one family would, however, sooner or later be followed (or have been preceded) by a rich generation.

To assure these "families" that their individual desires are being satisfied, a device must exist which manufactures and distributes real income and which also guarantees that a poor generation will indeed be followed by a rich one in the course of time. As for the distribution part of this device, it could be a simple random machine; as for the manufacturing part, it must be such that future total output will be large enough so that any accumulated shortfall of income can be made up in the future. If the total appears to be dwindling, this requirement might not be satisfied. The problem is that the historical record is ambiguous: from it one cannot tell if the economic part of society is performing appropriately. "Naive" forecasts based only on the recent past may indicate that currently it is not. Guesses based on the behaviour of presently rich families may lead to this same negative conclusion. There are, however, occasional signs which are interpreted hopefully by families with incomes which are currently below the national average:

intermarriage between children from rich and poor families; growth of one's own family's real income; knowledge that one's children have more education than oneself. These three signs are not only interconnected but are probably responsible for creating as well as reinforcing the egalitarian ideas being here discussed.

Publically supported and controlled education has been touted as an important factor responsible for growth in total income (i.e., educated people have produced technological and organizational innovations that have brought growth; they would not have done so without the education). Education has also been touted as a means whereby greater income equality will come in the future (i.e., raising the school-leaving age and subsidizing higher education reduces the dispersion of the number of years of education received by the population and, since income is related to educational attainment, the dispersion of incomes will also thereby be reduced). Finally, public education has been touted as a way of mixing youngsters from various parts of the society together and of providing for all a common experience. In consequence, marriage between members of different "families" will come to approximate more closely a random pattern. Looking at the historical record of the past 50 or 75 years, these claims for public education appear to be justified even though functionaries of the educational system probably oversold them. It is also probably true that egalitarian changes attributable to public education have decreased in the recent past. For example, the fraction of public educational expenditures devoted to increasing the educational attainment of the population (as opposed to maintaining it) has obviously fallen. Further, as the population of Ontario has become more urban, the dispersion of family

incomes found in a given school has probably decreased but the dispersion of average family incomes across schools has probably increased.

Looking at publicly supported education from the point of view of families whose current incomes are below average, it is plausible to suppose that their desires for a direct and immediate shift towards a more nearly equal income distribution will increase as the growth rate of their real incomes, the probability of intermarriage with richer families, or the educational attainment of their children relative to their own educational attainment decreases. But, by the previous argument, most families in this group will be unable to translate their desires into effective political action, i.e., most of these families will lie below the marginal voter in society's pecking order. But what is true for these low income families will also be true -- to a lesser degree -- of the marginal voter. Further, some supra-marginal voters may desire a more egalitarian society for altruistic reasons or as insurance for any of their children whose position in the income distribution is not secure. Insofar as school functionaries are themselves marginal voters or nearly so, special force will be placed behind changes in the educational system which would move it towards greater egalitarianism.

But what does egalitarianism imply for the educational system, given that the size of public educational expenditures needed simply to maintain rather than to enhance the educational attainment of the population is likely to rise?[63] Many economists would argue that

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63 If productivity increases in education are less than average productivity increases, and if salaries in education move upwards along with average wages and salaries, then costs of education must rise more rapidly than average costs.

adoption of their suggestions will reduce income differentials.[64] By advocating the removal of imperfections in the student loan market and by direct wealth transfers, however, economists are relying heavily on non-educational institutions.[65] So are those who argue in favour of eliminating private schools or changing school district boundaries (or, in the extreme, busing) as a way of bringing a more nearly random mixture of students to each school.[66] Those who argue for creating mixed-income neighbourhoods by changes in zoning ordinances or by scattering subsidized housing across the city, especially in richer neighbourhoods, also advocate non-educational changes, albeit changes which will have strong effects on schools. Finally come those who advocate weakening or modifying the credentials needed to obtain professional and quasi-professional jobs and those who advocate greatly expanding the number of such positions. Doing the first but not the second will, of course, have little effect and an increase in numbers will probably not take place unless accompanied by a drop in average salaries.

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64 Ribich and Murphy (1975) find from U.S. data that additional spending on public school education will increase average real income and narrow income differentials -- but may cost more than it is worth.

65 See Christensen, Melder, Weisbrod (1975) for evidence that income transfers which do not change socio-economic status will have little effect on university attendance. Presumably such transfers would be viewed by a recipient as transitory.

66 Most such proposals would, I suspect, fail as parents moved their residences -- even if the proposals could command political support.

Maximizing Ability Within Schools

Within the educational system itself, there is considerable ambiguity attached to the notion of egalitarianism. Using Arrow's terminology (1971a), achievement of "output equality" will be impossible unless there is "input inequality", i.e., if pupils are differently endowed by nature or upbringing, equal educational resources devoted to each will generate unequal outcomes since those better endowed will take fuller advantage of the resources they receive. But if "output equality" were achieved, national income is apt to decrease to the detriment of future moves towards equality.

To demonstrate this, refer to equation (7) in Chapter 2 which I rewrite as[67]

(1) $A = BF(P,S)$

On the basis of the data reported in Table 3.3, the argument there given, and the apparent use of these data by the Toronto public schools to sort pupils into the various secondary school programmes, $F(P,S)$ is assumed to be separable. This implies that $F_{PS} = 0$. Now comes a crucial assumption, namely that GNP may be viewed as a monotonically increasing function of literacy. Now consider an implication of this assumption: In order to maximize A, which is treated as the sum of reading ability scores taken over all pupils, $\partial A/\partial S = BF_S$ should be a constant. Differentiation of this condition then yields

(2) $F_S dB + B(F_{SS}dS + F_{SP}dP) = 0$

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67 Recall that A refers to ability, e.g., as measured by a reading ability test, that B denotes original genetic endowment, and that P and S denote parental and school influences respectively.

From this expression, rules may be extracted for the guidance of schools -- if maximization of A is desired -- in their treatment of children who differ in genetic endowment or in parental occupations, namely

$$(3)\quad \frac{\hat{dS}}{dB} = \frac{-F_s - BF_{sp}\frac{dP}{dB}}{BF_{ss}}, \qquad (4)\quad \frac{\hat{dS}}{dP} = \frac{-BF_{sp} - F_s\frac{dB}{dP}}{BF_{ss}}$$

$\hat{dS}/dB$ is interpreted as the change in schooling required for maximization of A as a child with one level of genetic endowment is replaced by a child with a higher or lower level. Hence, if $\hat{dS}/dB$ is positive, then genetically superior children should receive more schooling, and conversely. Similarly, if $\hat{dS}/dP$ is positive, then children whose parents hold high occupational positions should receive more schooling, and again conversely.

To discover the signs of these derivatives, empirical assumptions are needed, one of which has already been made, namely that $F_{SP} = 0$. In addition, I follow tradition and assume that F_S and F_{SS} are respectively positive and negative, i.e., that schooling (holding parental influence constant) increases reading ability but at a decreasing rate. From these three assumptions, it follows immediately that $\hat{dS}/dB$ is positive. In other words, to maximize the national pool of reading ability, more schooling should be devoted to children who are genetically superior.[68] Scarcely surprising.

Turn now to $\hat{dS}/dP$. What its sign is will be (in the context of the model here presented) determined entirely by the sign of dB/dP, which represents the influence of parental socio-economic position on the birth endowment of children. If richer and better educated

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68 At present, however, there is no way of identifying unambiguously a "genetically superior" child.(See article on Burt in NY Times, 28 Nov. 1976, and Goldberg, 1976.)

parents bear genetically superior children, it will be positive;[69] if superior children are randomly distributed over all parents, it will be zero. There seems to be no conclusive evidence on this matter and it is hard to see how evidence may be obtained. To make inferences regarding B on the basis of observations on A requires knowledge of or control over F(P,S). And this society does not possess.[70]

Although it is difficult to suppose that a government which responds to wishes of its electorate would take as an objective for schooling the maximization of the sum of reading ability scores, the notion of equality of opportunity is frequently alleged to be an objective. In the model just described, equality of opportunity could be interpreted as a promise by government that $\hat{dS}/dP$ will be zero, i.e., that public resources devoted to schooling at the elementary level will be the same on the average for children coming from each occupational group of parents, be they rich or poor. As has just been demonstrated, this behaviour by government is consistent with maximization of reading ability if F(P,S) is separable, F_S and F_{SS} are respectively positive and negative, and dB/dP is zero. These assumptions are, as we have seen, difficult to refute with data now at hand.

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69 If there were evidence that economically successful parents bore superior babies, dB/dP could still be zero or negative. The income distribution is skewed and more highly educated parents are usually urban and have fewer children. In consequence, if the occupational position of a family is raised, the probability is increased that the next genetically superior child will be born to a family in a lower social position.

70 See, however, the study of twins by Behrman and Taubman (1976).

Maximization of A would be consistent with the much larger amount of public resources devoted to youngsters who remain in school past school-leaving age only if these students were in fact genetically superior. In this interpretation, a method by which schools discover genetically superior youngsters is to devote the same resources to each over eight years and then pick those who score highest on tests. But this is a palpably false method and, in any case and as we have seen, is not actually followed. If scores on reading ability tests were used to select youngsters for five-year academic programmes in secondary schools, more youngsters from poor neighbourhoods would be included than are in fact included. In brief, the schools are not maximizing A nor are they modifying this objective in the direction of egalitarianism.

School functionaries sometimes appear to be arguing that they are forced to use tests on A as a proxy for measurement of B since B cannot be observed directly. But this cannot be a correct claim. School systems could sort students according to the apparent child-rearing ability and occupational position of their parents. Then, from each of the resulting groups of children, those who scored highest on tests would probably be genetically superior. If the assumption that dB/dP is zero were adopted, it would be appropriate to label as genetically superior the <u>same</u> percentage of youngsters in each such group of children.

It could be that school functionaries are making a different claim, namely that original genetic material is modified by subsequent training and experience in an irreversible manner. By analogy, once clay has been shaped on a wheel, glazed and fired, its transformation

back into wet clay is formidably expensive. Evidence from U.S. Headstart experiments showed that children whose IQ scores had increased during Headstart, after being returned to their neighbourhood schools, were soon indistinguishable in IQ scores from their non-headstart classmates. Burton White's speculations (Pines, 1975) confirm this view but Jerome Kagan's (1973) do not. Headstart evidence by itself is, of course, inconclusive. In a vague sense, irreversibility is plausible in that youngsters who find themselves performing poorly in school relative to their classmates will probably develop feelings of relative inferiority which, in turn, will probably damage self-confidence and weaken motivation to learn. In brief, there is at present insufficient knowledge to decide whether or to what extent irreversibility exists during the first ten or fifteen years of life. Insofar as schools use tests on A, undiscounted for differences in parental training of children, as a proxy for direct measurement of B, schools will be"self-justifying" in their treatment of children. In consequence, schools will be neither egalitarian nor will they be maximizing the sum of reading (or other) abilities.

The results of this section confirm my earlier speculation that the constraints imposed on schooling by the political power possessed by voters whose incomes are above average are indeed strong. Recommendations for educational policy which are made without consideration of these constraints are apt to be little more than pie in the sky. Those, like myself, who desire a school system which is more egalitarian and which also provides more (and better) schooling for genetically superior children face the difficult

task of finding ways of circumventing these constraints. And, if successful, we will then face the necessity of finding a suitable compromise between ability (or growth) and equality.

CHAPTER ELEVEN

TOWARDS EDUCATIONAL POLICY II

An influential portion of the public, many of whom have children at university, appears to believe that: (1) only about 20 per cent of a given age group is intellectually capable of university work; (2) society does not need even as many university graduates as are now being produced; (3) the cost of higher education is rising so rapidly that it is interfering with other social priorities such as health, transportation and welfare. In brief, by helping to hold the line on university enrolments, influential members of the public may believe that they are thereby helping society to avoid errors. At the same time, of course, these influential members of the public have kept financial barriers to higher education low as required by the ideal of equality of opportunity. That they and their children will benefit especially from restricted enrolments and low tuition fees is viewed as accidental and unavoidable.

Economists are inclined to treat these verbalizations and beliefs as rationalizations and ignore them in favour of an hypothesis that influential members of the public will act "as if" they were selfish utility maximizers (Pestieau, 1975; Mueller, 1976). Nonetheless, there are real issues here which may be divided into three parts: (1) What should be the total number (or percentage) of an age group that continues its formal education past school-leaving age? (2) Whatever this total number may be, which children

should be selected for education beyond the official school-leaving age? (In a fuller discussion, there would also be the question of what should be the school-leaving age.) (3) How should the cost of this extra education be distributed over society's members?

Items (2) and (3) in this list are intertwined and I have argued that their solution will depend upon factors over which school board or government has little control. Item (1) is similarly infected, e.g., if too few really competent students are reaching university, because of unavoidable social errors, then the "second-best" number to admit will be larger than the unattainable "first best" number. Nonetheless, item (1) is a useful point of departure.

A Market Solution

For initial argument, suppose that education beyond school-leaving age is simply a consumers' good produced under constant returns to scale and that no externalities are present. Then the market could be used to decide the quantity of higher education that should be produced and sold, unless the prior distribution of wealth and income were judged to be unjust or unless purchasers mistake their own self interest because, e.g., they have defective tastes and buy "too much" of other sorts of commodities which means "too little" education, or conversely. That higher education is partly a producers' good does not cause this market view to change. Of course, higher education does produce externalities -- but in both directions. Increasing returns to scale (or important indivisibilities) may be present and uncertainty about future benefits, coupled with private discount rates which may exceed

social discount rates, could easily make too small the quantity of higher education that is selected by the market. Education does, however, reduce the risk of unemployment and, in insuring against this risk, too much education may be selected.

Arguments similar to these can be made about a variety of commodities. Nonetheless, a social judgement has been made that the market will perform relatively poorly in the case of higher education. Before accepting this judgement, one should ask whether, in comparison with some "true" social optimum, the market would select too large or too small a quantity of higher education. Approval of the notion of equality of opportunity, implies a belief that an unregulated market would put too few youngsters in university because of a skewed distribution of parental income and wealth.[71] On top of this, add the belief that higher education provides positive externalities to persons who have not and whose children will not enter university. It is irrelevant whether this belief is true or false; for present purposes, simply notice that it also implies that the market would put too few youngsters into university. Finally, notice that if most parents and young people are risk averse and possess telescopic time horizons, then a third reason exists for supposing that the market will put too few youngsters into university -- unless substantial unemployment is expected and university is viewed as insurance against unemployment.

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71 See, however, J. Mincer (1958, 1970). From one reasonable point of view, lifetime utility "properly" discounted, the income distribution is not skewed -- although the children of poorer parents will see matters differently.

To put this argument into empirical terms, there should be a calculation of the number of youngsters who would remain in school past sixteen if there were an unregulated market for higher education. But how is such a calculation to be made? In no country does such a market exist and relevant data derived from other markets are hard to invent. Nonetheless, it is difficult to support the contention that, in Metro Toronto, fewer youngsters would enter university under an unregulated market than in fact do enter. In Chapter Nine, we found that, ex post, university would be "profitable" even if students (or their parents) did pay the full cost. In Chapter Three, we saw that the "intended" career plans of Grade 9 pupils would have put vastly larger numbers of youngsters into the five-year academic stream than in fact entered this stream. We also found that more parents would have supported their children into university than were obliged to do so. Finally, in Chapters Three and Four, we discovered that many students who scored high on reading aptitude tests in Grade 8 or high on scholastic aptitude tests in Grade 9 never reached Grade 13. It is plausible to suppose that such students -- had they entered university -- would have received at least the average rate of return on this investment. Finally, in the U.S. which is not much different from Ontario in per capita income, double the Ontario percentage do enter a college or university.

This evidence suggests that there is no prima facie case that current subsidization of higher education is necessary to prevent a drop in the percentage of youngsters attending university.[72]

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72 A reduction in subsidization of Ontario universities would, however, send more students to other provinces and countries for university.

Nonetheless, there are studies which attempt to estimate the elasticity of demand for university education with respect to parental income, tuition fees and travel cost, and foregone earnings. They claim that an increase in the costs of higher education would cause the quantity demanded to fall below current levels. In Canada, a good example of such investigations is a recent article by Crean (1973) in which, unfortunately, analysis begins with the assumption that "the provincial governments have been pouring resources into the school systems in sufficient quantities to keep the supply of places well up with the level of demand. Retention rates were therefore determined by the factors working on the demand side alone."

With reference to students resident in Metropolitan Toronto, we have seen already that the "supply of places" is restricted by streaming many apparently qualified students away from the five-year academic programme in Grades 8 and 9, by making transfers into this programme difficult during subsequent secondary school years and by discouraging or failing some Grade 13 students.[73]

The problem with the analyses put forward by Crean and others is not that estimates of elasticities are incorrect (although they may be) but with the inference that an increase in foregone earnings or in tuition fees would necessarily reduce the quantity of higher education demanded. If schools were to put a larger fraction of the age group into the five-year programme and Crean's estimates of elasticities were then applied to this larger group, the quantity

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73 Odd confirmation of "screening" comes from a comparison of full-time undergraduate enrolments in publically controlled institutions of higher education in the U.S. with the comparable figure for Ontario -- by sex. The per cent of students who are male are respectively 59 and 55.

of higher education demanded would also be larger.(In addition, if this were done, one would probably discover that his elasticity estimates were too low.) By taking institutional factors as given, Crean and others are treating an unrepresentative sample of young people as if it were the whole population. This same problem is found in estimates of the demand function for loanable funds when financial institutions are practicing credit rationing. The estimates will give correct predictions so long as the criteria used in the rationing are firmly followed; they will be incorrect if these criteria (or the income distribution) change.

Rationing

Those who do not want to let the market decide how many youngsters will remain in school past the age of sixteen are, in effect, arguing that a system of rationing will give better social results. Now rationing is usually advocated when excess demand is present or soon expected and the results of higher prices would, it is felt, be unfair to those at the low end of the income distribution and would, in any case, generate profits which could serve no useful social purpose in that more cannot soon or should not be produced. Is higher education currently being rationed for parallel reasons? If tuition fees were to rise, some youngsters from poorer families would, without question, be excluded but it is difficult to argue that the total number enrolling would fall if rationing were abolished and tuition fees rose. The interesting fact here is that government, schools and universities are extremely reluctant to find out. Yet experimentation would be simple and

bursaries would be easy to arrange, if there were a desire to protect the poor.[74] Presumably government believes it has discovered that voters prefer artificially low tuition fees, coupled with higher taxes, to the reverse. And clearly some voters will gain from subsidies plus taxes but these voters must be a minority, albeit an influential one.[75]

A more likely possibility is that rationing of higher education is designed to prevent too much from being produced rather than too little.[76] Implicitly, there seems to be a fear that many unqualified youngsters would, if rationing were abolished, reach Grade 13 and enrol in university to their own and society's detriment. In other words, it is implicitly assumed that the alleged positive externalities associated with higher education will turn into negative externalities if enrolments increase substantially. Or that increased educational expenditures will prevent purchases of socially more desirable goods. If one argues from the premise that government must pay the bulk of direct university costs, the assertion could be correct in a narrow sense, i.e., the marginal social benefit from an additional public dollar spent on health, welfare or transportation, could easily exceed the marginal social benefit from an additional public dollar

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74 Of course, one province by itself could not, for political reasons, put tuition fess much above what they were in other provinces.

75 If the rest of the voters are sure that taxes will anyway not be reduced and believe that other possible government expenditures would be still worse for them than are educational subsidies, then their potential approval of higher tuition fees may be neutralized.

76 "Too much" from the point of view of a professional who wishes to protect his income will probably be "too little" from society's larger view.

spent on higher education.

But that is not the issue here. Since rationing of higher education has been imposed, the allegation must be stronger. The question is: If rationing were abolished and replaced by a market, would the resulting (private) expenditures cause too much higher education to be produced? And, in order to separate one problem from another, the question should be answered under an assumption that these expenditures are "optimally" distributed over members of the relevant age group. Is it possible to invent a set of conditions which would give an affirmative answer to this question? Start by supposing that students register in university under the false impression that the benefit they will receive may be forecast from a naive model of benefits received in the past by similar individuals. Cycles in the case of engineers and lawyers have been reported in the literature and give credence to this postulate.[77] Evidence that students make errors is, however, not a sufficient basis for interference with our imaginary market. Government itself may make similar errors in the exercise of control (remember Keynes' (1930, p.223) famous castor oil-bismuth cycle). Further, government does not replace or control other markets in which similar errors are displayed, except in the case of agriculture to prevent cobweb "surpluses". But is a surplus of wheat like a surplus of education?

There is a short-run, second-best argument in favour of rationing which, however, depends critically upon two assumptions

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77 See Freeman (1975) in which there is some evidence that the cobweb will, ceteris paribus, converge.

regarding screening: (1) University graduates from richer families have first claim to well-paying and socially important jobs while graduates from less affluent families are forced to take jobs that are left over. (2) When the university participation rate increases, more academically smart youngsters from poor families go to university but more academically incompetent youngsters from rich families also go. In consequence, the average competence of persons holding well-paying and socially important jobs declines to the detriment of the whole society. If these assumptions describe the real world, rationing could be used to deny credentials to academically inferior but rich youngsters and thus prevent this decline in average competence from taking place. At the same time, of course, the percentage of middle-level manpower with university training would be kept from rising and this would be socially damaging in the longer run. This argument falls apart if universities keep out academically incompetent youngsters, regardless of parental background , or if high status parents is not a necessary condition for claiming an important job.

Arrow (1973) has described other conditions which would justify direct control of a market for higher education.[78] To paraphrase his argument: Nepotism in the labour market which favours those with university degrees could produce a pay differential between those with and those without degrees which exceeded differences in marginal (private and social) productivity. These differences would warp the income distribution towards those

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78 See also Taubman and Wales (1974) and Psacharopoulos (1974). Notice that the argument found in Psacharopoulos is not convincing.

with degrees. Unless the nepotism were severe enough to reduce total real output, however, to label this condition socially harmful requires a prior determination of the direction in which a desirable income distribution is to be found. Further, one would have to show that a larger quantity of higher education would shift the income distribution in this undesired direction. To complete the argument, suppose that a socially desirable income distribution will be easier to obtain if there is some nepotism, i.e., that it is possible to have too much nepotism and also too little. Or suppose that damaging social unrest will be the consequence of too rapid elimination of nepotism, i.e., that the existing social and occupational structure cannot now absorb into managerial and professional positions as many youngsters as free market would put into university.

To buttress this argument, suppose that economic growth will not be increased if more than, say, 20 per cent of the age group do go to university. And in a world in which the fruits of research in the form of investment goods, temporary immigrants, organizational schemes and published research reports can be cheaply imported, this could well be the case. Circumstances may change in the future but one thing at a time.

There is one pseudo and one real difficulty with this argument: (1) If a change in circumstances does take place and more university graduates are needed for economic growth (or to prevent decline), a 10-15-year lead time is needed to prevent error -- or already trained immigrants must be available to fill the gap. For Canada such immigrants will probably be available.

(2) If a larger quantity of university education will not increase economic growth, then higher education becomes a consumers' good. On what basis then does government ration it? Why not let a market determine how much is produced and purchased, especially since many other non-rationed commodities are more polluting in production and are heavier users of exhaustible resources?

We seem to have come full circle to discover that government and schools act "as if" they feared further change in the distribution of education across society and consequent possible change in the distribution of income. In this, however, they are probably doing little more than reflecting the wishes of dominant social groups.

Policy Recommendations[79]

Suppose a more egalitarian society is taken as a policy objective. At what places in the system we have examined would one push? First, in the schools I would downplay the use of reading and literature tests as screening devices and stress instead tests in science and mathematics. As the recent 19-country evaluation of educational achievement shows (IAEE, 1974), home influences are of overwhelming importance in explaining differences in reading and literature achievement but are less important in the case of science, math and foreign languages that are not spoken by parents.[80] I would also stress the importance of the so-called practical arts, e.g., auto mechanics, typing, computer programming as well as more

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79 Projected declining enrolments in both elementary and secondary schools for several more years and a projected levelling off of post-secondary enrolments make these recommendations budgetarilly feasible at the present time, i.e., their adoption would probably not increase the fraction of government expenditures devoted to education.

80 In this connection see Appendix Table 4.2 (b and c) and notice that an unusually high percentage of Canadian university students take degrees in the "humanities and education". See OECD (1970).

recreational skills such as weaving, pottery, music, woodworking, for all youngsters. This change would make less important the head-start given to their children by middle class and rich parents (Hill and Stafford, 1974). Second, I would teach in secondary schools methods of raising very young children and, to this end, would attach day care centres to secondary schools for demonstration and training.[81] Third, I would use Grade 13 only as a makeup year and put the resources thus saved into early primary grades so that individual attention could be given there to so-called deprived children.

Turning to education past age sixteen, I would also join most economists in advocating a larger role for market mechanisms which means higher tuition fees and correspondingly lower tax support. The provinces would, of course, have to move together in making this change. At the same time, however, to protect youngsters from the accident of having been born into poor families or families who do not favour higher education, liberal loans, repayable from future earnings on a contingent basis should be made available as well as conventional loans repayable in constant purchasing power dollars plus modest interest charges (Nerlove, 1975; Feldman, 1976). This would have to be a responsibility of the federal government. Scholarships for the first two years of university should be provided also which, however, should be awarded by secondary schools, not universities, and in strict proportion to the size of each secondary

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81 Some readers will object to this suggestion on grounds that too little is known about child rearing to entrust it to schools which might adopt faddish ways. They could be correct.

school's Grade 12 enrolment, with special arrangements provided for recent immigrant people. At the same time, federal government might well reward poor families whose children continued their education past age sixteen. If there were a negative income tax, a simple way of doing this would be to increase the guaranteed minimum income for every family whose children remained in school past school-leaving age.[82]

Suggestions of the sort just listed should change the characteristics of the process by which students are screening away from, as well as increase the visible demand for, higher education. Movement towards a more egalitarian society does, however, require more than this. Although outside the scope of this report, particular attention should be addressed to: (1) the use of zoning and subsidized housing to create mixed-income neighbourhoods; (2) raising the minimum family income guaranteed by society, e.g., by means of a negative income tax scheme; (3) changing the hierarchical structure of government and private organizations by the adoption and encouragement of decentralization. Radical critics would go further and advocate direct wealth transfers in substantial amounts as being necessary.

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82 I have purposely omitted a suggestion that province-wide examinations in, e.g., English, mathematics, another language, be reinstalled. This is because the correlation between average marks and scholastic aptitude scores were quite low in the Carnegie Study and because the influence of the examinations then set did not seem to produce a sensible curriculum (see Frye, 1962). If universities were to set the examination and if the average score and standard deviation of those admitted to each university were a matter of public record, then the results might be an improvement over present arrangements.

On Monitoring the Educational System

To detect changes in the performance of our educational system as well as problem areas therein, administrators need measuring instruments that are cheap, simple to use and reasonably reliable. This study has identified three candidates:

1. The move from senior public school into secondary school could be monitored on the basis of reports which could easily be submitted each fall by the principals of all secondary schools. By school of Grade 8 origin, the number of pupils found in each Grade 9 programme is what is desired. Each school board could then add numbers to find the percentage of pupils coming from each senior public school who are found in Grade 9 courses that normally lead to a Grade 13 honours diploma. Circulation of the data obtained to all public school principals and to the Ministry of Education, plus a request for explanation from senior public schools which displayed unusually low or high percentages, should prove useful .
2. For secondary schools, new reports are not needed. From regularly collected data, the Ministry could easily produce annually for each secondary school that offers Grade 13 subjects and for each school board: (a) the ratio of this year's Grade 13 enrolment to last year's Grade 12 enrolment (both taken in September); (b) the ratio of Grade 13 honours diplomas as of June to the preceding September's Grade 13 enrolment. Again a tabulation of the resulting

pairs of ratios for all schools and school boards should be circulated and accompanied by a request for explanation addressed to school boards displaying unusually low or high ratio values. (If Grade 13 were eliminated, the data just mentioned should be for Grade 11 and Grade 12.)

For myself, I would prefer that the three bits of information just described be routinely made part of the public record, available to parents and other interested parties. Such a wish, however, will be viewed as radical and not in the public interest in that invidious comparisons would thereby be invited and these would create problems for bureaucrats. While such an argument is too self-serving for more than political consideration, it will probably be conclusive. A great deal could, however, be accomplished by circulation of the data just described to principals and school boards on a confidential basis.

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